

Часть 2

Part 2

PART 2. Event 1997.11.04 – (1997-308)

Particle event: To(Ep>10 MeV) – 04d07^h

Tmax₁(Ep>10 MeV) – 04d11^h, Jmax₁ (Ep>10 MeV) – 66 /cm².s.sr

Tmax₂(Ep>10 MeV) – 05d02^h, Jmax₂ (Ep>10 MeV) – 17.5 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 470 MeV

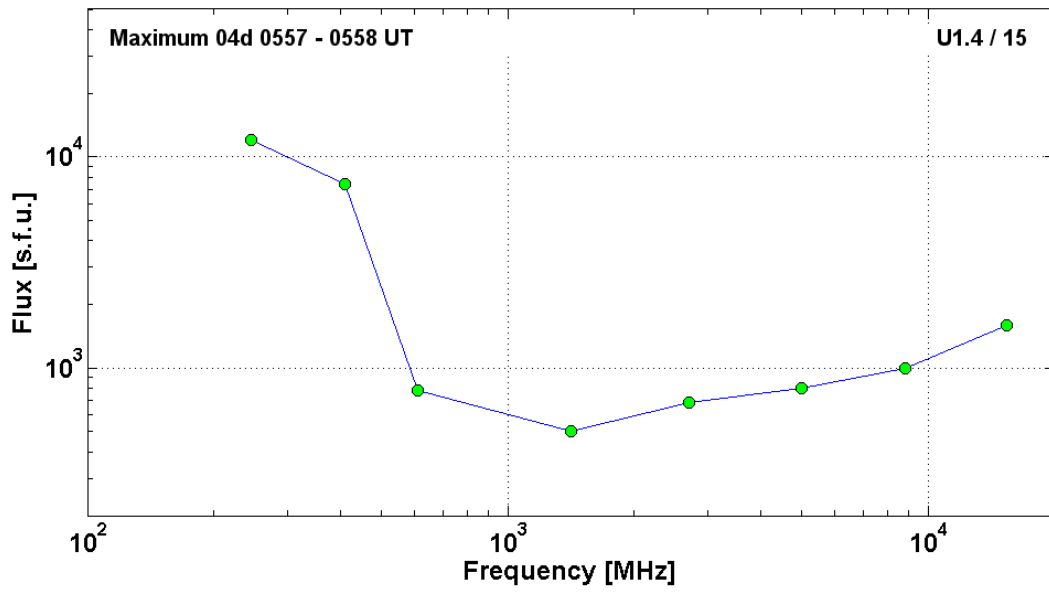
– Emax₂ = 320 MeV

Sources: • solar flare 04d05^h52^m, X2.1/3B, S14W34, AR8100

Main burst X-ray 1–8 Å: onset – 04d05^h52^m, max – 04d05^h58^m, Φ = 0.056 J/m²

CME: 04d06^h10^m, V= 0785 km/s, Δφ = 360°, dA= 243°

1997	November 04	•			AR 8100	To event 335	
H _α	6563 Å	0554	0559	0648	S14 W34	3B	CF
1 – 12	keV	0552	0558	0648		X2.1	5.6E-2
52.7 – 92.8	keV	<060958	~063020	064148		9	YOKHO HXT
15.4	GHz	0556.0	0557.0	0607.0	U1.4 / 15	3.20	
8.8	GHz	0555.0	0557.0	0602.0		3.00	
5	GHz	0555.0	0557.0	0604.0		2.90	
2.7	GHz	0555.0	0557.0	0604.0		2.84	
1.4	GHz	0556.0	0557.0	0604.0		2.70	
610	MHz	0556.0	0557.0	0610.0		2.89	
410	MHz	0556.0	0558.0	0611.0		3.87	
245	MHz	0555.0	0558.0	0611.0		4.08	
DS II	SH	0558		0607	30-230	3	
DS II		0559		0606	30-50	3	
DS II	FN	0600		0607	18-60	3	
DS II	FN	0607		0615	18-34	3	
DS II	SH	0608		0617	25-75	3	
DS II		0608		0611	50-73	3	
DS IV	FS	0606		>0709	20-200	3	
DS III	G	0556		0558	25-410	3	
DS III	G	0557		0602	100-1200	2	
DS III	B	0817		0818	2000-4315	1	
DS V		0556		0614	35-85	3	
DS DCIM	G	0817		0822	1000-1525	1	
CME		0610	0785km/s	-22.1 km/s ²	360°	243°	



PART 2. Event 1997.11.06 – (1997-310) – GLE-55

Particle event: To(Ep>10 MeV) – 06d13^h

Tmax(Ep>10 MeV) – 7d02^h, Jmax(Ep>10 MeV) – 430 /cm².s.sr

Duration of the event – 7 days

Maximum recorded proton energy of the event – Emax = 2900 MeV

Sources: • solar flare <06d11^h22^m, 2B/X9.4, S18W63, AR8100

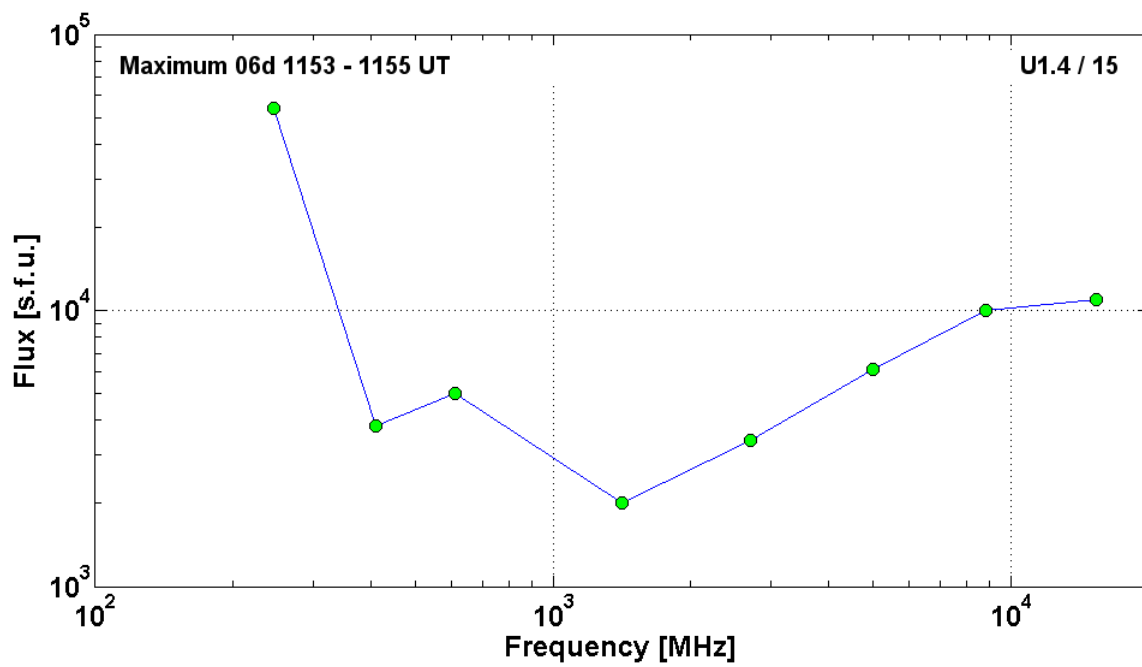
Main burst X-ray 1-8 Å: onset – 06d11^h49^m, max –06d11^h55^m, Jmax = 0.036 J/m²

CME: 06d12^h10^m, V= 1556 km/s, Δφ = 360°, dA = 262°

▲ SC 06d22^h52^m

1997	November 06	•	AR 8100	To event 336			
Hα	6563 Å	<1122	1156	1244	S18 W63	2B	FH
1 – 12	keV	1149	1155	1201		X9.4	3.6E-1
53 – 93	keV	1151:12	~1154	1213		1E+9	HSX2 Y
OSSE		1156	(3)	(3)	(3)	(3)	N
15.4	GHz	1151	1153	1209	U1.4 / 15	4.04	
8.8	GHz	1151	1153	1212		4	
5	GHz	1151	1153	1210		3.79	
2.7	GHz	1151	1153	1216		3.53	
1.4	GHz	1152	1153	1219		3.3	
610	MHz	1151	1154	1217		3.7	
410	MHz	0	1155	1216		3.58	
245	MHz	1149	1153	1220		4.73	
DS II		1153		1216	45-245	2	
DS IV		1152		1728	30-80	3	
DS IV		1152		1446	35-85	3	
DS IV	FS	1152		~1418	40-800	3	
DS III	G	1134		1141	40-325	3	
DS III	G	1151		1152	40-800	3	
DS III	GG	1151		1159	45-270	3	
DS CONT		1152		>1308	45-270	3	
DS DCIM	GG	1151		1220	2000-4295	3	
DS DCIM	GG	1152		1217	1000-2000	3	
DS DCIM		1152		1216	800-1000	3	
CME		1210	1556 km/s	-44.1km/s	360°	262°	

(3) Data not available due to SAA passage.



PART 2. Event 1997.11.13 – (1997-317)

Particle event: To(Ep>10 MeV) – 13d23^h

Tmax(Ep>10 MeV) – 14d04^h, Jmax (Ep>10 MeV) – 1.3 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 170 MeV

Sources: ☐ flare event on the back side, AR8100 5d behind W-limb

CME: 13d22^h26^m, V = 546 km/s, Δφ = 288°; dA = 310°

1997 November 13 ☐ AR 8100 To event 337

Electromagnetic and corpuscular radiation it was not observed							
CME		2226	546km/s	-7.4km/s	288°	310°	

PART 2. Event 1998.04.20 – (1998-110)

Particle event: To(Ep>10 MeV) – 20d11^h

Tmax₁(Ep>10 MeV) – 21d06^h, Jmax₁(Ep>10 MeV) – 860 /cm².s.sr

Tmax₂(Ep>10 MeV) – 21d12^h, Jmax₂(Ep>10 MeV) – 1600 /cm².s.sr

Duration of the event – 7 days

Maximum recorded proton energy of the event – Emax₁ = 440 MeV

– Emax₂ = 600 MeV

Sources: ■ solar flare 20d09^h38^m, M1.4/EPL, S20W90, AR8194 ~2 days behind the W-limb.

Main burst X-ray 1-8 Å: onset – 20d09^h38^m, max – 20d10^h21^m, Φ = 0.061 J/m²

CME: 10^h07^m, V = 1863 km/s, Δφ = 165°; dA = 284°;

Δ SC 23d18^h25^m

1998	April 20	■	AR8194	To event 338		
Hα	6563 Å	No	Flare	Patrol		
EPL	6563 Å	<0931		>1000	S43 W90	3
1 – 12	keV	0938	1021	1118		M1.4 6.1E-2
23 – 33	keV	095035	095035	095037		71 SXS22 Y
DS II	UE	0956		~0959	40-60	
DS III	G	0937		0937	140-170	
DS III	G	0950		0955	110-140	
DS III	G	1007		1012	40-65	
DS CONT		0957		0958	45-55	
DS CONT		1003		~1012	55-90	
DS UNCLF		0955		1001	110-140	
CME		1007	1863 km/s	43.5 km/s	165°	284°

PART 2. Event 1998.04.30 – (1998-120)

Particle event: To(Ep>10 MeV) – 30d02^h

Tmax₁(Ep>10 MeV) – 30d15^h, Jmax (Ep>10 MeV) – 1.3 /cm².s.sr

Tmax₂(Ep>10 MeV) – 01d15^h, Jmax (Ep>10 MeV) – 1.2 /cm².s.sr *)

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 65 MeV

– Emax₂ = 80 MeV

*) Data from IMP-8 (CPME)

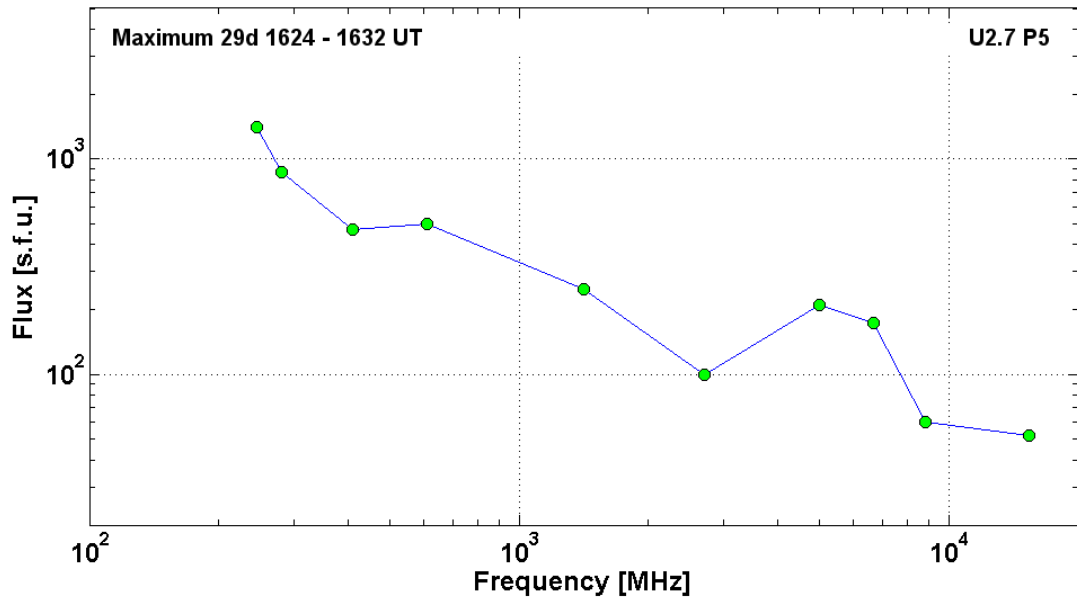
Sources: • solar flare 29d16^h00^m, M6.8/3B, S16E22, AR8210

Main burst X-ray 1-8 Å: onset – 29d16^h00^m, max – 29d16^h37^m, Φ = 0.1 J/m²

CME: 30d16^h58^m, V = 1374 km/s, Δφ = 360°, dA = 336°

Δ SC 01d21^h56^m

1998	April 29	•	AR8210	To event 339			
H _α	6563 Å	1605	1630	2104	S16 E22	3B	FTUZ
1 – 12	keV	1606	1637	1659		M6.8	1.0E-1
50 – 100	keV	<163927	~163931	1702		334	HXS2 Y
15.4	GHz	1631	1631	1632		1.72	
8.8	GHz	1630	1631	1631		1.78	
6.7	GHz	1612.7	1630	1638.9		2.24	
5	GHz	1629	1630	1636	U2.7 P5	2.32	
2.7	GHz	1629	1630	1636		2	
1.4	GHz	1619	1624	1636		2.4	
610	MHz	1624	1626	1636		2.7	
410	MHz	1624	1632	1636		2.67	
280	MHz	1623.4	1632	1710		2.94	
245	MHz	1627	1630	1636		3.15	
DS II	SH,H	1622		1632	40-90	3	
DS II	UE,H	1637		1700	40-90	3	
DS IV		1613		1702	40-800	3	
DS IV		1702		1720	35-85	3	
DS III	GG	1607		1614	40-400	3	
DS III	G	1700		1701	40-170	3	
DS V		1613		1619	30-80	2	
DS DCIM		1610		1610	450-750	2	
DS DCIM	GG,FS	1613		1653	800-2000	3	
DS DCIM	GG	1613		1630	2000-4395	2	
CME		1658	1374 km/s		360°	336°	



PART 2. Event 1998.05.02 – (1998-122) – GLE-56

Particle event: To(Ep>10 MeV) – 02d14^h

Tmax(Ep>10 MeV) – 02d16^h, Jmax (Ep>10 MeV) – 130 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 500 MeV

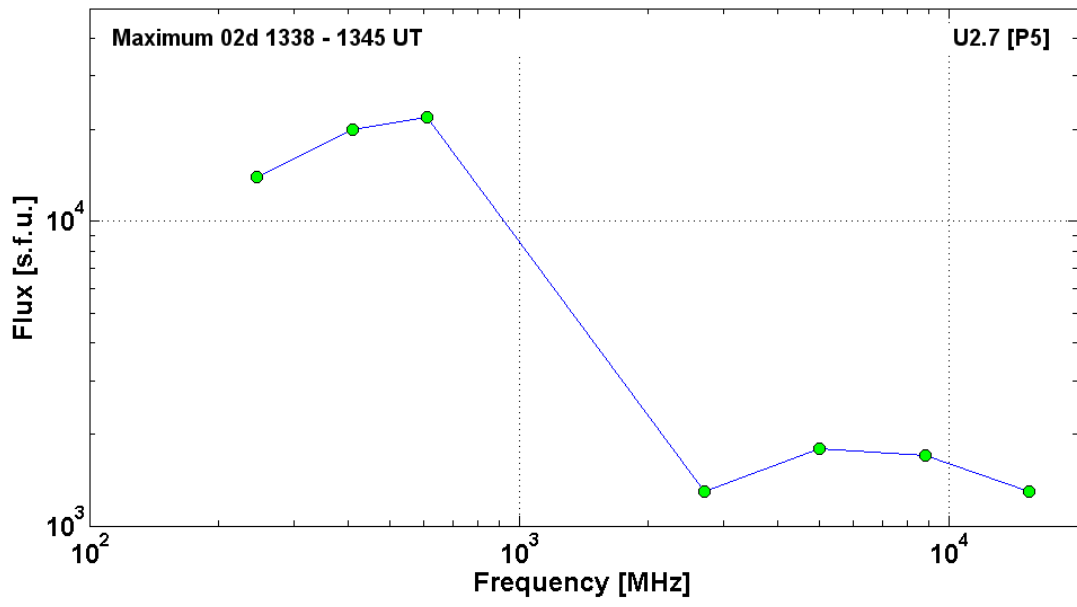
Sources: • solar flare 02d13^h31^m, X1.1/3B, S15W15, AR8210

Main burst X-ray 1-8 Å: onset – 02d13^h31^m, max – 02d13^h42^m, Φ = 0.067 J/m²

CME: 02d14^h06^m, V = 0938 km/s, Δφ = 360°, dA = 331°

Δ SC 03d17^h43^m

1998	May 02	•			AR8210	To event 340	
H _α	6563 Å	1334	1342	1540	S15 W15	3B	FZ
1 – 12	keV	1331	1342	1351		X1.1	6.7E-2
57 – 100	keV	133422	133730	>133742		524	HXS2 Y
15.4	GHz	1337	1341	1513		3.11	
8.8	GHz	1337	1341	1513		3.23	
5	GHz	1335	1338	1513	U2.7 [P5]	3.26	
2.7	GHz	1337	1338	1513		3.11	
610	MHz	1334	1344	1513		4.34	
410	MHz	1334	1345	1505		4.3	
245	MHz	1333	1338	1511		4.15	
DS IV		1338		1723	35-85	3	
DS DCIM	GG,FS,SP	1334		1355	800-2000	3	
DS DCIM	GG,FS	1336		1348	2000-4395	3	
CME		1406	0938 km/s		360°	331°	



PART 2. Event 1998.05.06 – (1998-126) – GLE-57

Particle event: To(Ep>10 MeV) – 06d08^h

Tmax(Ep>10 MeV) – 06d09^h, Jmax (Ep>10 MeV) – 120 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 300 MeV

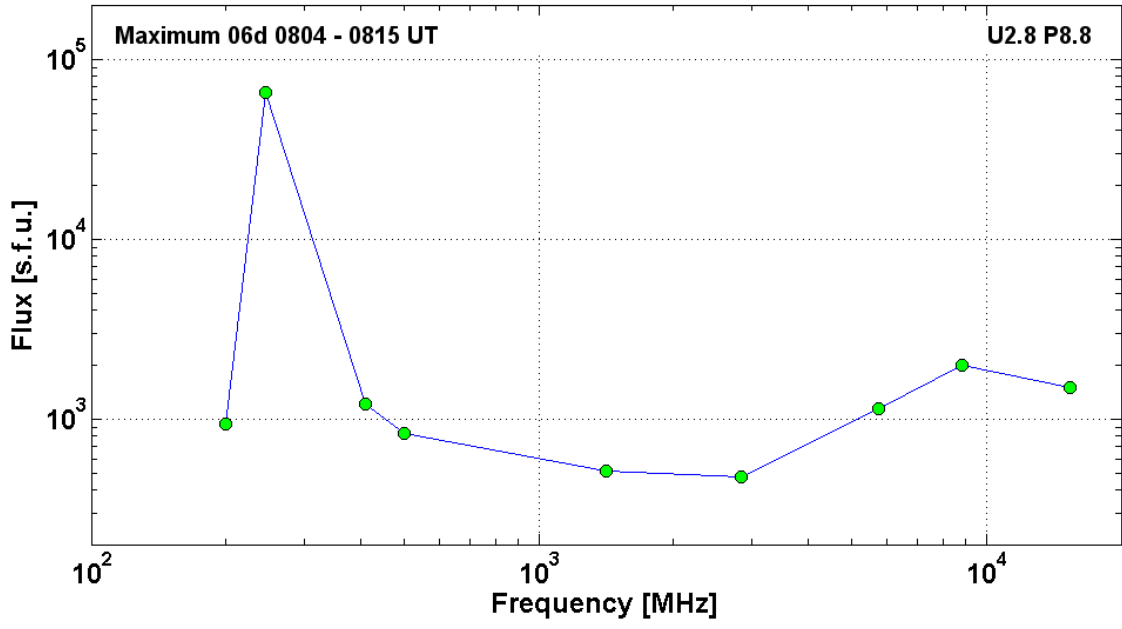
Sources: • solar flare 06d07^h58^m, X2.7/1N, S15W64, AR8210

Main burst X-ray 1-8 Å: onset – 06d07^h58^m, max – 06d08^h09^m, Φ = 0.21 J/m²

CME: 06d08^h29^m, V = 1099 km/s, Δφ = 190°, dA=309°;

Δ SC 08d09^h52^m

1998	May 06	•			AR8210	To event 341	
H _α	6563 Å	0801	0805	>0918	S15 W64	1N	
1 – 12	keV	0758	0809	0820		X2.7	2.1E-1
57 – 100	keV	075728	080610	>090818		1020	HXS2 Y
200 – 10000	keV	0808					Y
15.4	GHz	801	807	824		3.18	
8.8	GHz	801	807	822	U2.8 P8.8	3.3	
5.7	GHz	646.1	809.2	<1030.1		3.06	
2.8	GHz	711	804	957		2.68	
1.4	GHz	801	804	828		2.71	
500	MHz	800	815	905		2.92	
410	MHz	801	811	828		3.08	
245	MHz	800	806	806		4.81	
200	MHz	803	806	811		2.97	
DS II	HARM	805		819	45-270	3	
DS IV		810		817	300-1100	2	
DS III	G	801		804	25-160	3	
DS CONT		801		802	45-65	2	
DS DCIM	GG,FS,SP	800		821	800-2000	3	
DS DCIM	GG,FS	801		828	2000-4395	3	
CME		0829	1099 km/s		190°	309°	



PART 2. Event 1998.05.09 – (1998-129)

Particle event: To(Ep>10 MeV) – 09d06^h

Tmax₁(Ep>10 MeV) – 09d13^h, Jmax₁ (Ep>10 MeV) – 4.7 /cm².s.sr

Tmax₂(Ep>10 MeV) – 09d23^h, Jmax₂ (Ep>10 MeV) – 8.9 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 230 MeV

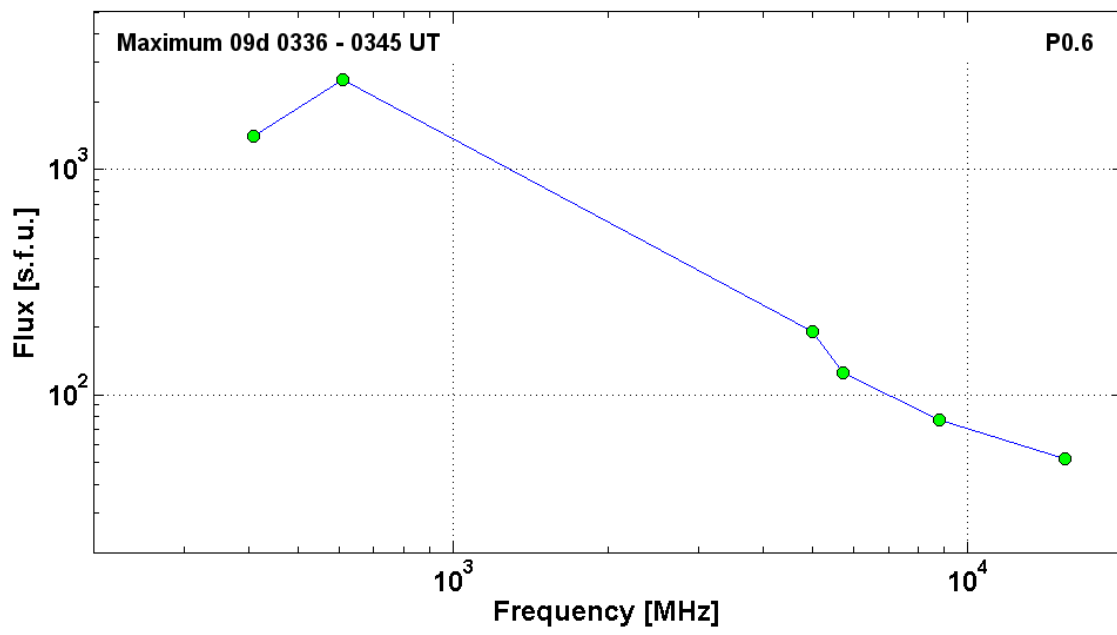
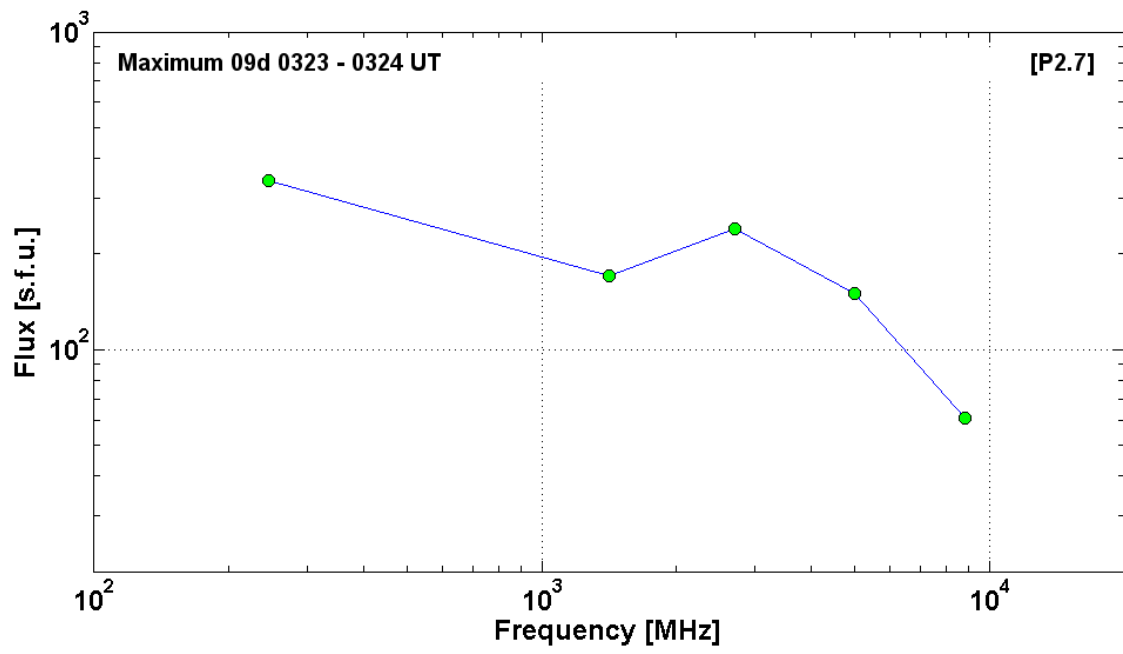
– Emax₂ = 235 MeV

Sources: ■ solar flare 09d03^h 04^m, M7.7/ -, s15w90, AR8210 ~ one day behind the W-limb burst X-ray 1-8 Å: onset – 09d03^h04^m, max – 09d03^h40^m, Φ = 0.11 J/m²

CME: 09d03^h35^m, V = 2331 km/s, Δφ = 178°, dA = 262°;

1998	May 09	■			AR8210	To event 342	
H _α	6563 Å	No Flare Patrol			s15w90*		
1 – 12.5	keV	0304	0340	0355		M7.7	1.1E-1
57 – 100	keV	031733	032641	045755		673	HXS1, Y
57 – 100	keV	031733	032641	045755		243	HXS2 Y
8.8	GHz	0323	0323	0325		1.79	
5	GHz	0323	0323	0332		2.18	
2.7	GHz	0322	0323	0347	[P2.7]	2.38	
1.4	GHz	0322	0324	0346		2.23	
245	MHz	0323	0324	0330		2.53	
DS II	FN	0326		0329	23-75	3	
DS II	SH	0326		0329	50-150	3	
DS III		0314		0331	30-80	3	
DS III	G	0322		0328	18-310	2	
15.4	GHz	0335	0336	0339		1.72	
8.8	GHz	0335	0337	0339		1.89	
5.7	GHz	0310	0337	0353		2.1	
5	GHz	0323	0337	0347		2.28	
610	MHz	0323	0345	0352	P0.6	3.4	
410	MHz	0323	0345	0352		3.15	
DS II	FN	0331		0341	20-75	3	
DS II	SH	0331		0342	40-150	3	
DS IV		0323		0350	200-1000	2	
DS IV		0331		0413	30-80	3	
DS III	N	0320		0348	25-75	2	
CME		0335	2331km/s		178°	262°	

* – probable localization of the flare event



PART 2. Event 1998.06.16 – (1998-167)

Particle event: To(Ep>10 MeV) – 16d21^h

Tmax₁(Ep>10 MeV) –17d09^h, Jmax₁ (Ep>10 MeV) – 1.3 /cm².s.sr

Tmax₂(Ep>10 MeV) –18d02^h, Jmax₂ (Ep>10 MeV) – 1.4 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 80 MeV

– Emax₂ = 75 MeV

Sources: ■ solar flare 16d18^h03^m, M1.0/ - , s22w90, AR8232 one day behind the W-limb

Main burst X-ray 1-8 Å: onset – 16d18^h 03^m, max – 16d18^h 42^m, Φ = 0.037 J/m²

CME: 16d18^h27^m, V = 1484 km/s, Δφ = 281°, dA = 278°;

1998	June 16	■	AR8232	To event 343			
Hα	6563 Å	No Flare					
LPS	6563 Å	1956		2202	S17 W90		
1 – 12	keV	1803	1842	1928		M1.0	3.7E-2
CME		1827	1484 km/s		360°	262°	

PART 2. Event 1998.08.22 – (1998-234)

Particle event: To(Ep>10 MeV) – 22d06^h

Tmax₁(Ep>10 MeV) – 23d00^h, Jmax₁(Ep>10 MeV) – 1.7 /cm².s.sr

Tmax₂(Ep>10 MeV) – 23d08^h, Jmax₁(Ep>10 MeV) – 1.5 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 80 MeV

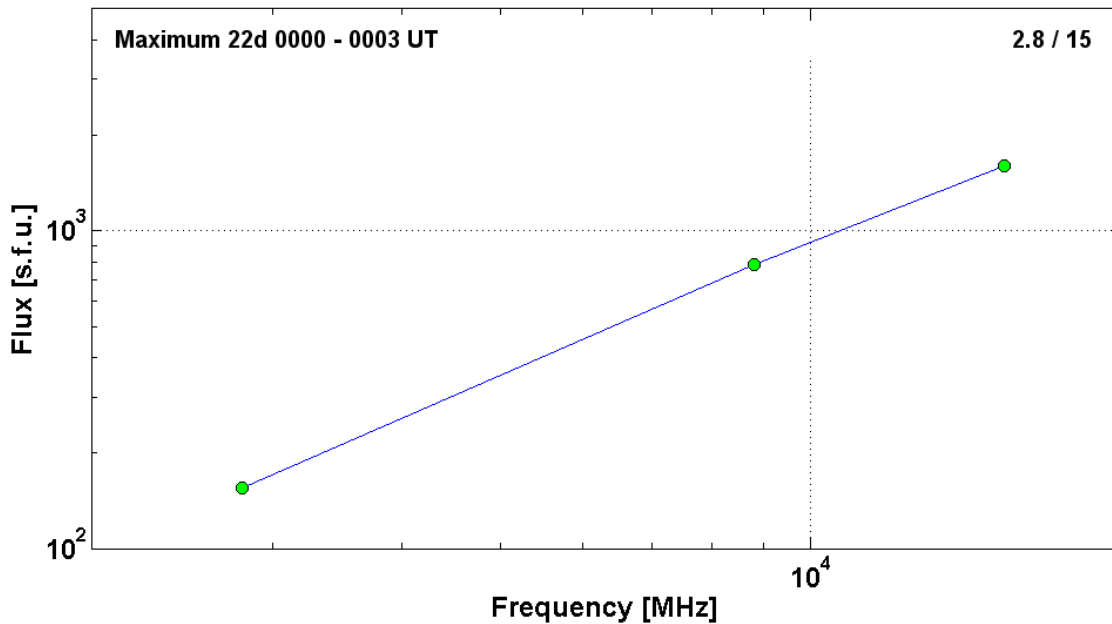
– Emax₂ = 85 MeV

Sources: • solar flare 21d23^h57^m, M9.0/2B, N42E51, AR8307

Main burst X-ray 1-8 Å: onset – 21d23^h57^m, max – 22d00^h09^m, Φ = 0.061 J/m²

CME: gap

1998	August 22	•		AR8307	To event 344		
Hα	6563 Å	<0009	0016	>0140	N42 E51	2B	
1 – 12	keV	2357	0009	0016		M9.0	6.1E-2
15.4	GHz	2359.0	0003.0	0017.0	2.8 / 15	3.20	
8.8	GHz	2359.0	0003.0	0013.0		2.89	
2.8	GHz	2358.0	0000.0	0100.0		2.19	
DS II	FN	0005		0023	20-120	3	
DS II	SH	0005		0017	40-280	3	
DS IV		0004		0129	30-80	2	
DS III	G	0007		0009	18-300	2	
CME							gap



PART 2. Event 1998.08.24 – (1998-236) – GLE-58

Particle event: To(Ep>10 MeV) – 24d23^h

Tmax₁(Ep>10 MeV) – 25d02^h, Jmax₁(Ep>10 MeV) – 320 /cm².s.sr

Tmax₂(Ep>10 MeV) – 26d07^h, Jmax₂(Ep>10 MeV) – 210 /cm².s.sr

Duration of the event – 6 days

Maximum recorded proton energy of the event – Emax₁ = 660 MeV

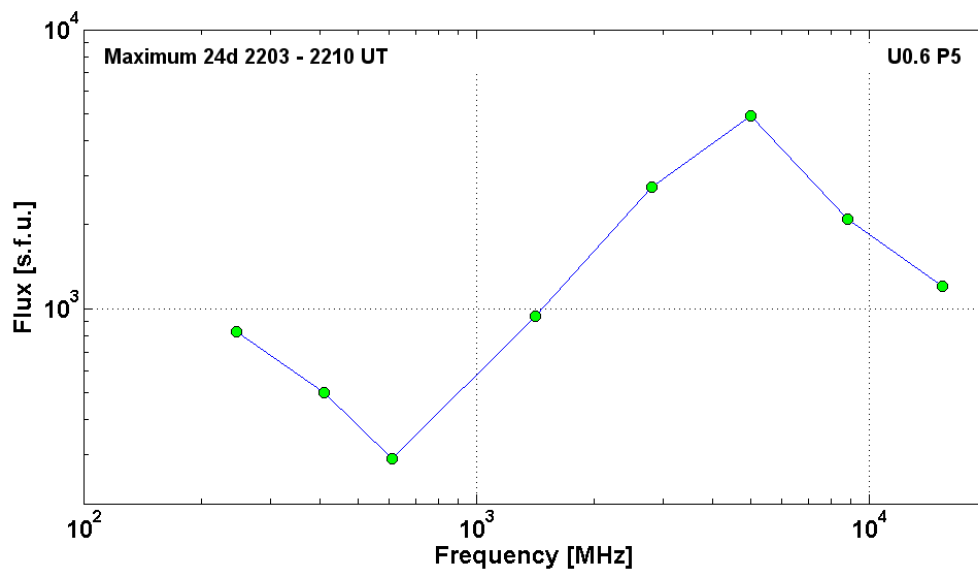
– Emax₂ = 270 MeV

Sources: • solar flare 24d21^h48^m, 3B/ X1.0, N35E09, AR8307

Main burst X-ray 1-8 Å: onset – 24d21^h50^m, max – 24d22^h12^m, Φ = 0.16 J/m²

CME: gap

1998	August 24	•	AR8307	To event 345
Hα	6563 Å	2148	2204	>25 ^d 0108
1 – 12	keV	2150	2212	2235
53 – 93	keV	<2218	~2218	2248
15.4	GHz	2200.0	2203.0	2302.0
8.8	GHz	2200.0	2203.0	2302.0
5	GHz	2159.0	2203.0	2231.0
2.8	GHz	2150.0	2205.0	>2232.0
1.4	GHz	2157.0	2210.0	2231.0
610	MHz	2159.0	2203.0	2235.0
410	MHz	2158.0	2203.0	2236.0
245	MHz	2158.0	2203.0	2302.0
DS II	SH,H	2203		2218
DS IV	FS	2203		>2400
DS III	G	2158		2205
CME				



PART 2. Event 1998.09.23 (1998-266)

Particle event: To(Ep>10 MeV) – 23d13^h

Tmax(Ep>10 MeV) – 25d01^h, Jmax (Ep>10 MeV) – 22 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 80 MeV

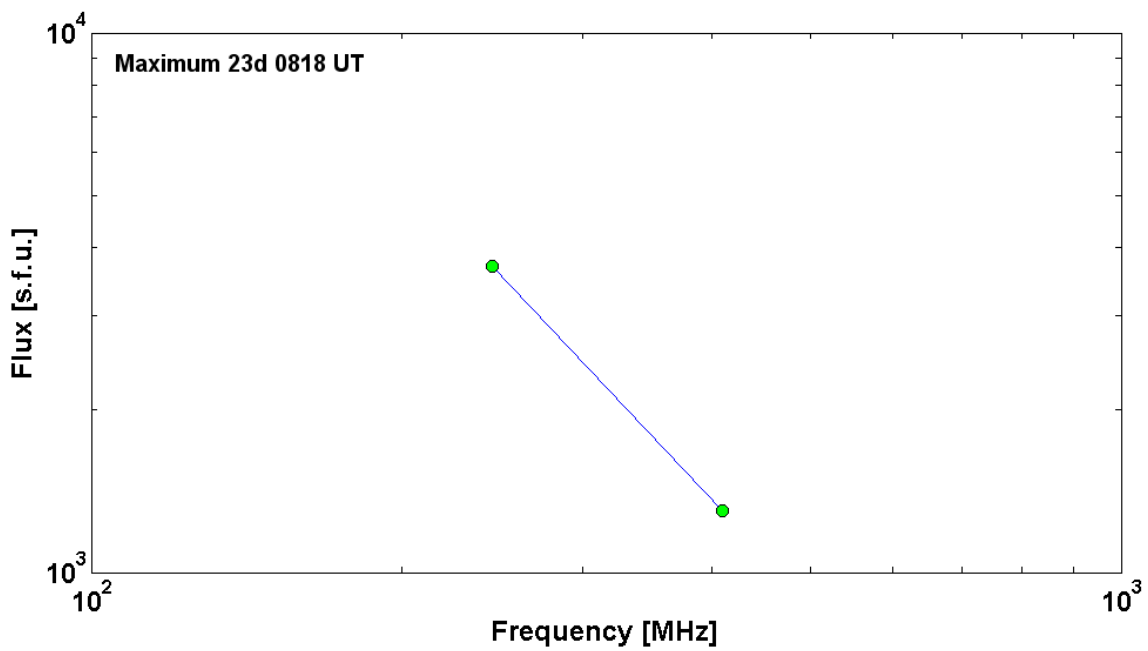
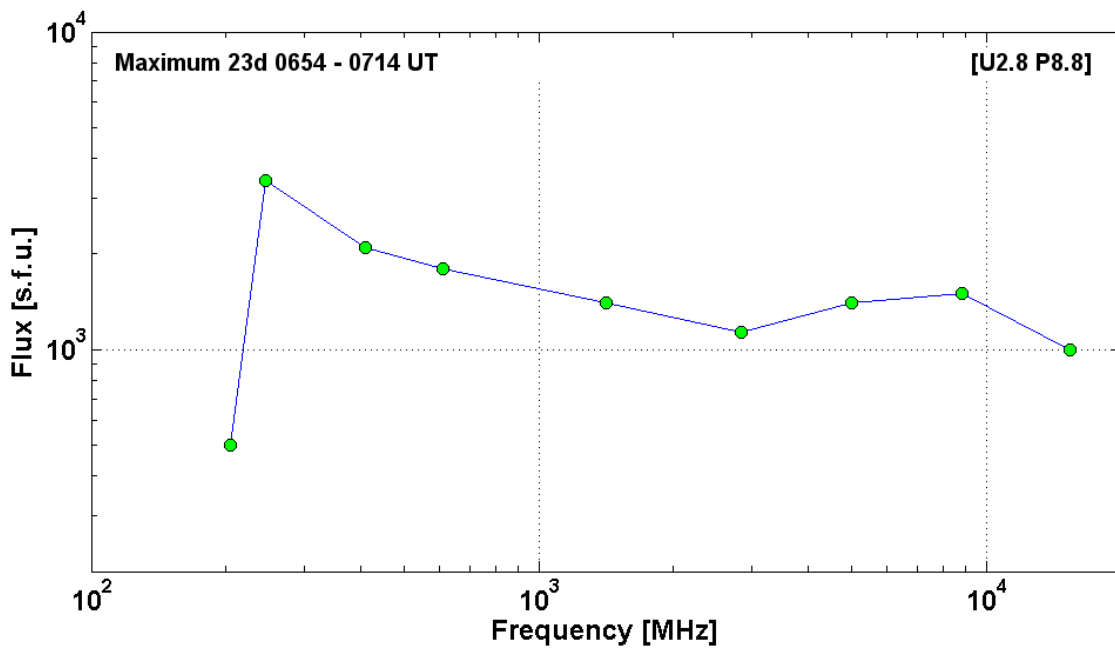
Sources: • solar flare 23d06^h40^m, M7.1/3B , N19E09, AR8340

Main burst X-ray 1-8 Å: onset – 23d06^h40^m, max – 23d07^h 13^m, Φ = 0.12 J/m²

CME: gap

▲ SC 24d23^h45^m

1998	September 23	•	AR8340	To event 346		
Hα	6563 Å	0643	0701	0937	N19E09	3B CEFHU
1 – 12	keV	0640	0713	0731		M7.1 1.2E-1
53-93	keV	>070434	~070436	>112234		697 HSX2 Y
15.4	GHz	0652.0	0656.0	0723.0		3.00
8.8	GHz	0651.0	0656.0	0741.0		3.18
5	GHz	0649.0	0656.0	0755.0		3.15
2.8	GHz	0620.0	0701.0	0809.0	[U2.8 P8.8]	3.05
1.4	GHz	0647.0	0654.0	0743.0		3.15
610	MHz	0652.0	0656.0	0747.0		3.26
410	MHz	0652.0	0709.0	0748.0		3.32
245	MHz	0655.0	0711.0	0747.0		3.53
204	MHz	0653.5	0714.0	0724.5		2.70
DS II	SH,H	0656		~0719	40-280	3
DS II	FN	0704		0714	18-50	2
DS IV		0653		>0725	30-900	2
DS III	B	0722		0723	200-800	2
DS DCIM	GG,SP	0643		0737	800-2000	3
DS DCIM	GG	0717		0742	2000-4395	2
410	MHz	0814.0	0818.0	0820.0		3.11
245	MHz	0815.0	0818.0	0820.0		3.57
DS DCIM	GG	0801		0835	800-2000	3
CME						gap



PART 2. Event 1998.09.30 – (1998-273)

Particle event: To(Ep>10 MeV) – 30d14^h

Tmax(Ep>10 MeV) – 30d23^h, Jmax (Ep>10 MeV) – 785 /cm².s.sr

Duration of the event – 3 days

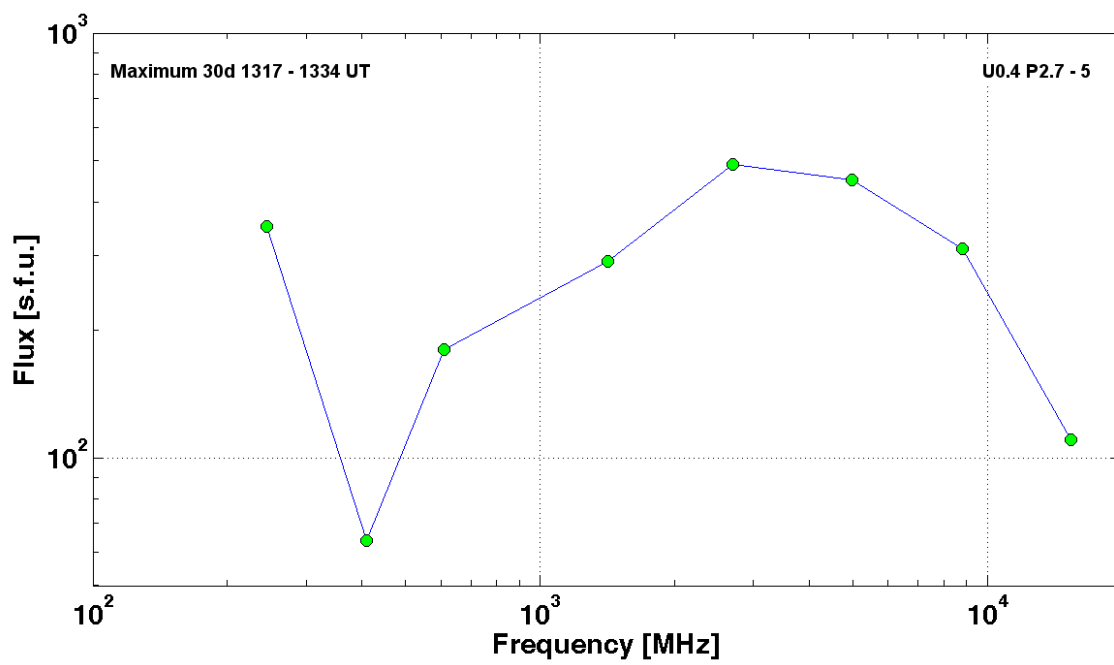
Maximum recorded proton energy of the event – Emax = 600 MeV

Sources: • solar flare 30d13^h08^m, M2.8/2N, N23W78, AR8340

Main burst X-ray 1-8Å: onset – 30d13^h08^m, max – 30d13^h50^m, Φ = 0.11 J/m²

CME: gap

1998	September 30	•			AR8340	To event 347	
Hα	6563 Å	1402	1434	1542	N23 W78	2N	FY
1 – 12	keV	1308	1350	1448		M2.8	1.1E-1
57-100	keV	<1314	~1343	>1344		354	HSX2 Y
15.4	GHz	1327.0	1331.0	0000.0		2.04	
8.8	GHz	1325.0	1331.0	1350.0		2.49	
5	GHz	1317.0	1334.0	1405.0	U0.4 P2.7 - 5	2.65	
2.7	GHz	1312.0	1330.0	1405.0		2.69	
1.4	GHz	1317.0	1332.0	1405.0		2.46	
610	MHz	1312.0	1317.0	0000.0		2.26	
410	MHz	1312.0	1317.0	1410.0		1.81	
245	MHz	1310.0	~1329.0	1405.0		2.54	
245	MHz	1251.0	1329.0	0000.0		2.54	
DS II		1322		1330	35-85	3	
DS IV		1310		~1500	40-800	3	
DS III	G	1307		1312	40-90	2	
DS V		1308		1315	30-63	2	
DS DCIM	GG	1308		1355	800-2000	3	
DS DCIM	GG	1309		1355	2000-4400	3	
CME							gap



PART 2. Event 1998.10.18 – (1998-291)

Particle event: To(Ep>10 MeV) – 18d22^h

Tmax₁(Ep>10 MeV) – 19d02^h Jmax₁(Ep>10 MeV) – 1.8 /cm².s.sr

Tmax₂(Ep>10 MeV) – 19d06^h Jmax₂(Ep>10 MeV) – 2.3 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 140 MeV

– Emax₂ = 85 MeV

Sources: o solar flare 18d01^h38^m, M2.4/2B, N16W53, AR8358

o DSF 15d<10^h05^m, N19E10, 27°

Main burst X-ray 1-8Å: onset – 18d01^h38^m, max – 18d01^h45^m, Φ = 0.001 J/m²

CME: 15d10^h05^m, V = 199 km/s, Δφ = 360°, dA = 264°

▲ SC 18d19^h52^m

1998	October 18	o			AR8358	To event 348	
Hα	6563 Å	0142	0144	0202	N16 W53	2B	EFH
1 – 12	keV	0138	0145	0152		M2.4	9.9E–3
410	MHz	0158	0318		85	110	
CME							gap

1998	October 15	o		AR	To event 348		
DSF	6562 Å	<1005		<1101	N19E10	27°	*
1 – 12	keV						
CME		15 ^d 1004	0199 km/s	3.2 km/s	360°	264°	

* – PRF1207, 1208

PART 2. Even 1998.11.06 – (1998-310)

Particle event: To(Ep>10 MeV) – 06d03^h

Tmax(Ep>10 MeV) – 06d12^h, Jmax(Ep>10 MeV) – 4.6 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 80 MeV

Sources: • solar flare 05^d<18^h39^m, 2B/M8.4, N22W18, AR8375

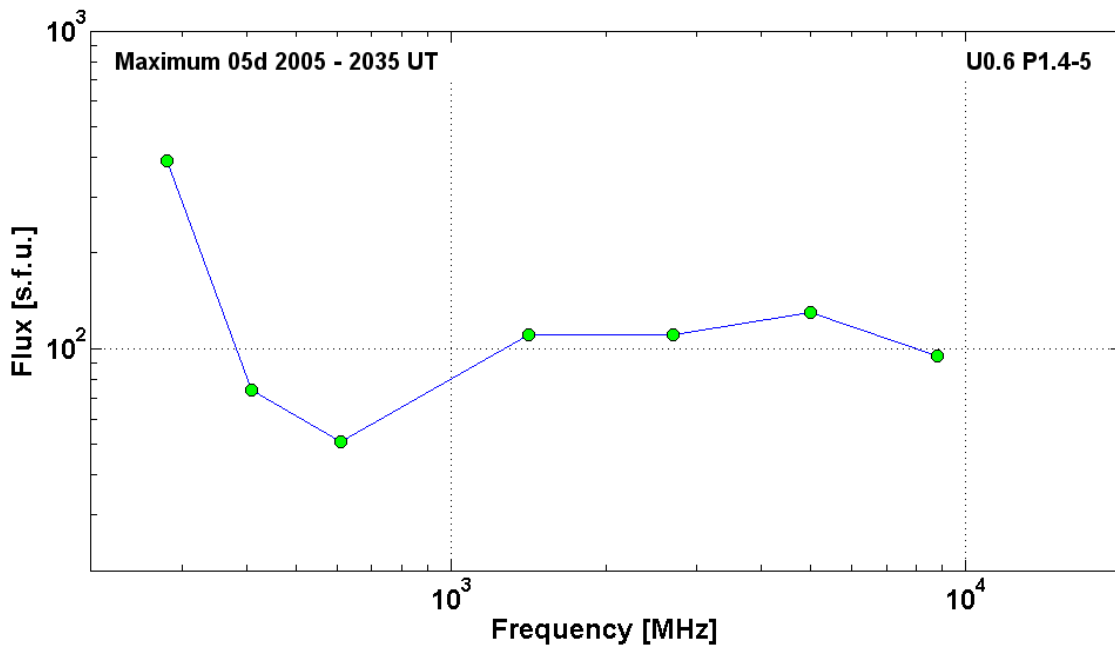
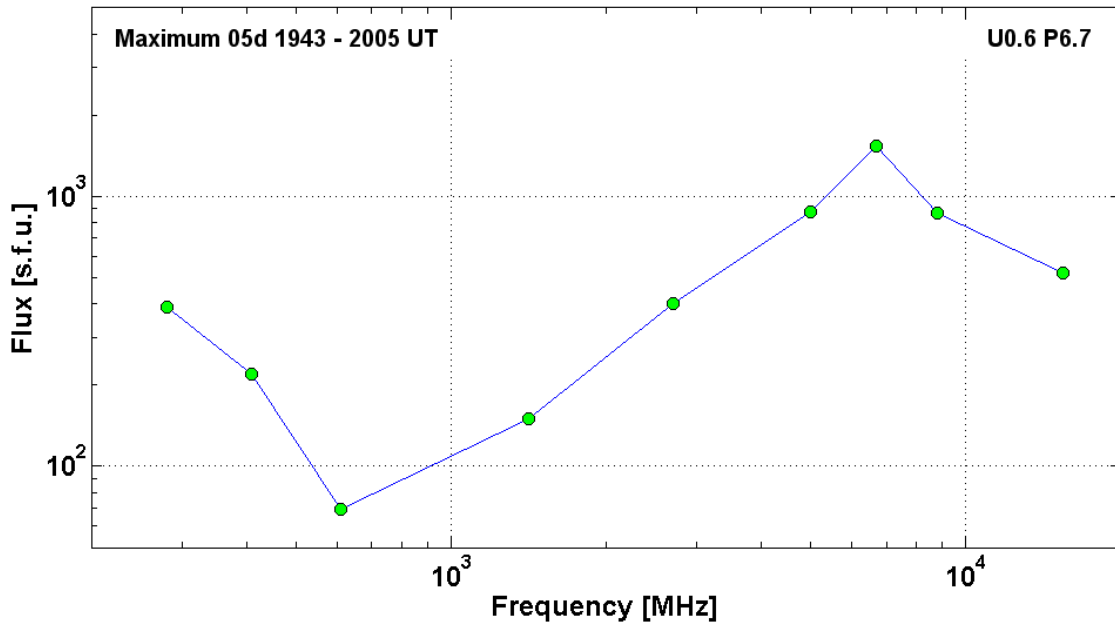
Main X-ray burst 1-8 Å: onset – 05d19^h00^m, max – 05d19^h55^m, Φ = 0.11 J/m²

CME:05d20^h44^m, V = 1118 km/s, Δφ = 360°, dA = 300°

Δ SC 07d08^h15^m

1998	November 05	•	AR8375			To event 349	
Hα	6563 Å	<1839*	1950	>2334	N22 W18	2B	T
1 – 12	keV	1900	1955	2012		M8.4	1.1E–1
>300 keV	keV	193749	194343	201520		742.61	BATS
15.4	GHz	1941.0	1944.0	2048.0		2.72	
8.8	GHz	1941.0	1943.0	2006.0		2.94	
6.7	GHz	1937.9	1952.2	2046.9	U0.6 P6.7	3.19	
5	GHz	1941.0	1952.0	2053.0		2.94	
2.7	GHz	1941.0	1952.0	2055.0		2.60	
1.4	GHz	1942.0	1946.0	2055.0		2.18	
610	MHz	1945.0	1954.0	2055.0		1.84	
410	MHz	1944.0	1945.0	2053.0		2.34	
280	MHz	1951.0	2005.2			2.59	
DS II		1951		1957	25-75	2	
8.8	GHz	2026.0	2027.0	2045.0		1.98	
5	GHz	2016.0	2026.0	2047.0	U0.6 P1.4-5	2.11	
2.7	GHz	2016.0	2035.0	2047.0		2.04	
1.4	GHz	2015.0	2026.0	2047.0		2.04	
610	MHz	2025.0	2027.0	2047.0		1.71	
410	MHz	2015.0	2015.0	2047.0		1.87	
280	MHz	1951.0	2005.2			2.59	
DS IV		<2015		2142	25-300	2	
DS III	N	2017		2037	18-180	2	
DS CONT		2010		0337	25-55	1	
CME		2044	1118 km/s	-24.0 km/s ²	360°	300°	

* – No Flare Patrol 5^d 1729 – 1839



PART 2. Event 1998.11.07 – (1998-311)

Particle event: To($E_p > 10$ MeV) – 07d07^h

$T_{max_1}(E_p > 10$ MeV) – 07d14^h, $J_{max_1}(E_p > 10$ MeV) – 2.8 /cm².s.sr

$T_{max_2}(E_p > 10$ MeV) – 08d02^h, $J_{max_2}(E_p > 10$ MeV) – 6 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – $E_{max_1} = 80$ MeV

– $E_{max_2} = 85$ MeV

Sources: • solar flare 07d11^h02^m, M2.4/SN, N14W43, AR8375

Main X-ray burst 1-8 Å: onset – 07d11^h 02^m, max – 07d11^h 06^m, $\Phi = 0.005$ J/m²

CME: 07d11^h54^m, $V = 0632$ km/s, $\Delta\phi = 360^\circ$, $dA = 258^\circ$

▲ SC 08d04^h51^m

1998 November 07 • AR8375 To event 350

H α	6563 Å	1104	1108	1116	N14 W43	SN	C
1 – 12.5	keV	1102	1106	1116		M2.4	4.9E-3
53 – 93	keV	<110522	110558	111100		788	Y
>300	MeV	110410	110556	110934			B
3	GHz	1104.5	1106.0	1108.3		1.70	
204	MHz	1104.6	1104.8	1107.8		4.51	
DS DCIM	G	1104		1106	2000-4375	2	
DS DCIM	G	1104		1107	800-2000	2	
CME		1154	0632 km/s	1.3 km/s	360°	258°	

PART 2. Event 1998.11.14 – (1998-318)

Particle event: To(Ep>10 MeV) – 14d06^h

Tmax₁(Ep>10 MeV) – 14d12^h, Jmax₁ (Ep>10 MeV) – 250 /cm².s.sr

Tmax₂(Ep>10 MeV) – 15d06^h, Jmax₂ (Ep>10 MeV) – 10 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 580 MeV

– Emax₂ = 190 MeV

Sources: ☐ solar flare 14d05^h00^m, C1.3/..., N28W90, AR8375 two days behind W-limb

Main X-ray burst 1-8 Å: onset – 14d05^h00^m, max – 14d05^h 08^m, Φ = 0.013 J/m²

CME: gap

1998	November 14	☐ AR8375				To event 351	
Hα	6563 Å	No Flare					
BSL	6563 Å	0518		0543	N28 W90		
1 -12.5	keV	0500	0508	0515		C1.3	6.1E-04
33 – 53	keV	0503:11	0505:13	0506:23		339	Y
5.7	GHz	0500.3	0505.1	0532.3		0.90	
245	MHz	0502.0	0502.0	0503.0		2.04	
DS II	SH	0506		0524	35-160	3	
DS II	FN	0506		0528	18-70	3	
DS IV		0501		0536	30-80	3	
DS III	G	0502		0506	18-230	2	
CME							gap

PART 2. Event 1998.11.22 – (1998-326)

Particle event: To(Ep>10 MeV) – 22d07^h

Tmax₁(Ep>10 MeV) – 22d09^h, Jmax₁ (Ep>10 MeV) – 1.1 /cm².s.sr

Tmax₂(Ep>10 MeV) – 22d14^h, Jmax₂ (Ep>10 MeV) – 0.6 /cm².s.sr

Duration of the event – 1.5 day

Maximum recorded proton energy of the event – Emax₁ = 290 MeV

– Emax₂ = 160 MeV

Sources: • solar flare 22d06^h30^m, X3.7/1N, S27W82, AR8384

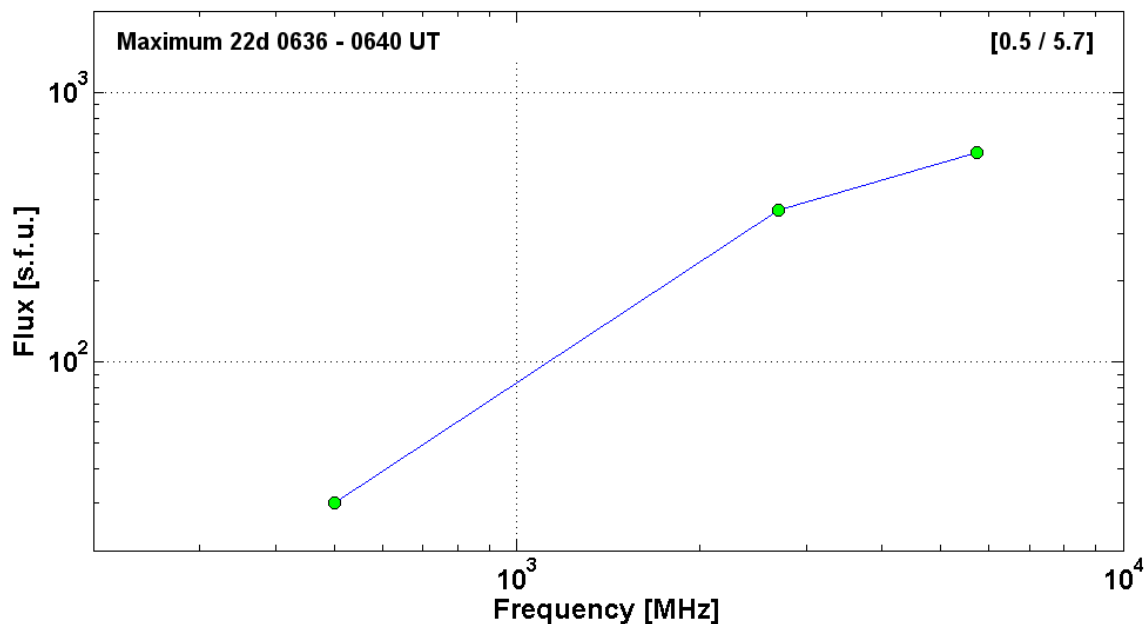
Main burst X-ray 1-8 Å: onset – 22d06^h30^m, max – 22d06^h 42^m, Φ = 0.2 J/m²

CME: gap

1998 November 22 • AR8384 To event 352

Hα		0635	0645	0711	S27W82	1N	*
1 -12.5	keV	0630	0642	0649		X3.7	2.0E-1
53 – 93	keV	<063720	064014	081534		6689	Y
>16	MeV		0639				O
>300	MeV	063336	063917	064837			B
5.7	GHz	0630.8	~0640.0	0742.0	[0.5 / 5.7]	~2.78	5.7
2.7	GHz	0632.0	0636.0	0649.0		2.56	2.7
500	MHz	0636.2	0640.6	0646.2		1.48	
DS II	SH	0638		0706	30-420	3	
DS II	FN	0639		~0650	25-170	3	
CME							gap

* – PRF1212



PART 2. Event 1998.11.24 – (1998-328)

Particle event: To(Ep>10 MeV) – 24d03^h

Tmax(Ep>10 MeV) – 24d10^h, Jmax (Ep>10 MeV) – 1.25 /cm².s.sr *)

Duration of the event – 2 days *)

Maximum recorded proton energy of the event – Emax₁ = 215 MeV

*) According to data IMP-8 (CPME)

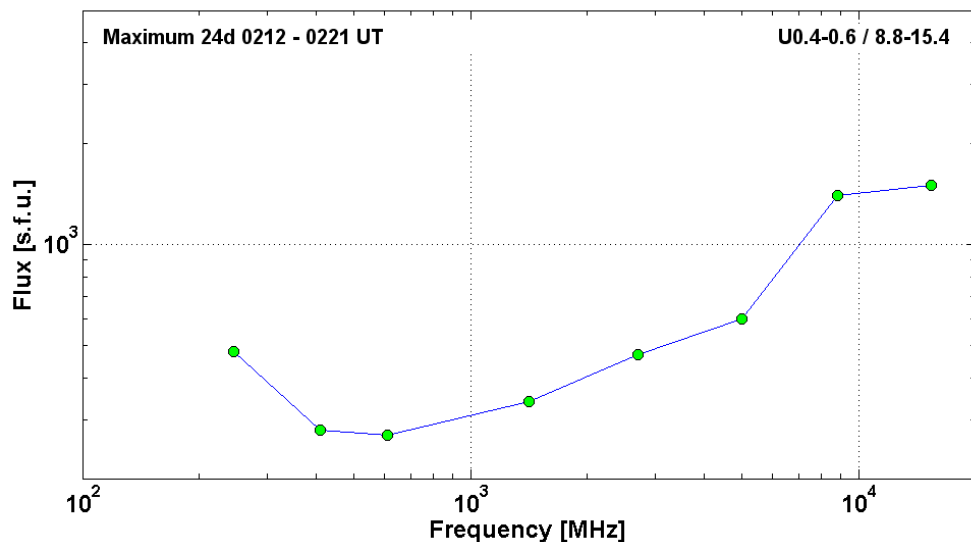
Sources: • solar flare 24d02^h07^m, X1.0/SF, S30W81, AR8384

Main x-ray burst 1-8 Å: onset – 24d02^h07^m, max – 24d02^h20^m, Φ = 0.12 J/m²

CME: 24d02^h30^m, V = 1798 km/s, Δφ = 360°, dA = 225°

1998 November 24 • AR8384 To event 353

Hα		0256	0256	0259	S30 W81	SF	
1 -12.5	keV	0207	0220	0237		X1.0	1.2E-1
53 – 93	keV	<0217:19	~0217:19	0407:25		256	Y
>300		0206:04	0214:31	0244:37		0.00	B
15.4	GHz	0209.0	0215.0	0221.0	U0.4-0.6/8.8-15.4	3.18	15.4
8.8	GHz	0208.0	0215.0	0225.0		3.15	8.8
5	GHz	0207.0	0214.0	0225.0		2.78	
2.7	GHz	0208.0	0214.0	0222.0		2.67	
1.4	GHz	0210.0	0214.0	0221.0		2.53	
610	MHz	0210.0	0212.0	0223.0		2.43	
410	MHz	0212.0	0221.0	0222.0		2.45	
245	MHz	0215.0	0215.0	0223.0		2.68	
DS II	SH,H	0217		0222	60-150	2	
DS II	FN,H	0218		0220	35-60	2	
DS III	G	0215		0216	18-270	3	
CME		0230	1798 km/s	-12.5 km/s ²	360°	225°	



PART 2. Event 1999.01.20 – (1999-020)

Particle event: To(Ep>10 MeV) – 20d23^h

Tmax₁(Ep>10 MeV) – 21d11^h, Jmax₁ (Ep>10 MeV) – 1.3 /cm².s.sr

Tmax₂(Ep>10 MeV) – 22d06^h, Jmax₂ (Ep>10 MeV) – 1 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax₁ = 270 MeV

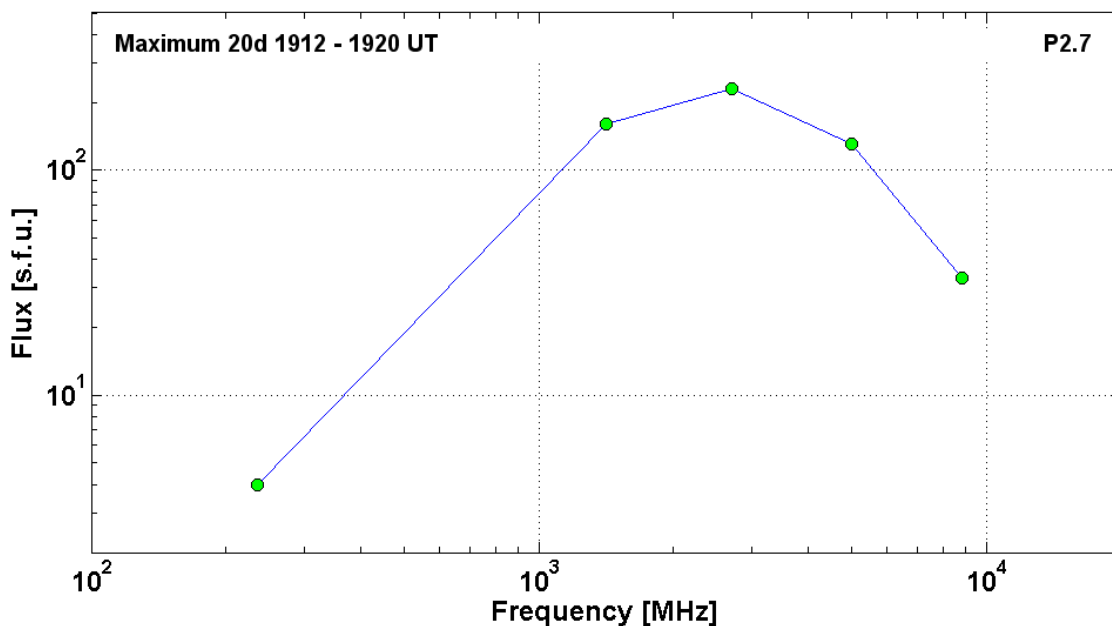
– Emax₂ = 250 MeV

Sources: ☐ solar flare 20d19^h06^m, M5.2/..., n27e90, AR – unknown

Main X-ray burst 1-8 Å: onset – 20d19^h06^m, max – 20d20^h04^m, Φ = 0.25 J/m²

CME: gap

1999	January 20	☐	ARXXXX			To event 354	
Hα	6563 Å	No Flare Patrol			n27e90		
1 -12.5	keV	1906	2004	2100		M5.2	2.5E-1
33 – 53	keV	190511	191931	>192325		389	Y
8.8	GHz	1911.0	1912.0	1912.0		1.52	
5	GHz	1911.0	1920.0	2130.0		2.11	
2.7	GHz	1909.0	1920.0	2029.0	P2.7	2.36	
1.4	GHz	1905.0	1919.0	2008.0		2.20	
235	MHz	1854.6	1919.0	1940.0		0.60	
DS II		1914		1923	25-55	1	
DS IV		1926		1944	25-45	2	
DS V		1926		1935	30-55	1	
CME							gap



PART 2. Event 1999.01.22 – (1999-022)

Particle event: To($E_p > 10$ MeV) – 22d02^h

$T_{max_1}(E_p > 10$ MeV) – 22d16^h, $J_{max_1}(E_p > 10$ MeV) – 3 /cm².s.sr

$T_{max_2}(E_p > 10$ MeV) – 23d14^h, $J_{max_2}(E_p > 10$ MeV) – 5 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – $E_{max_1} = 90$ MeV

– $E_{max_2} = 85$ MeV

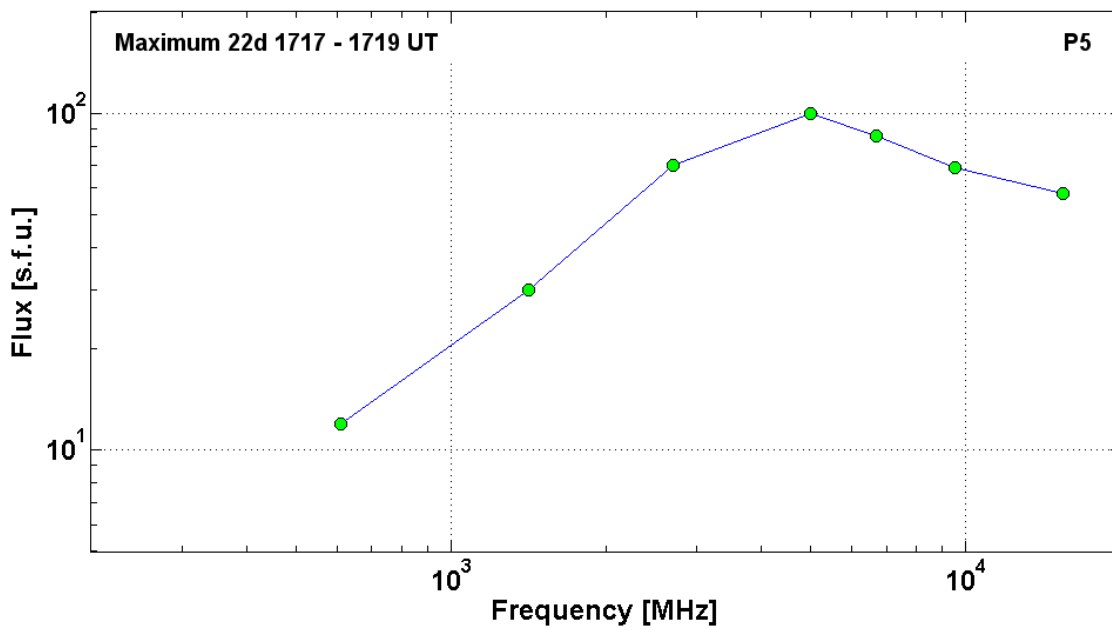
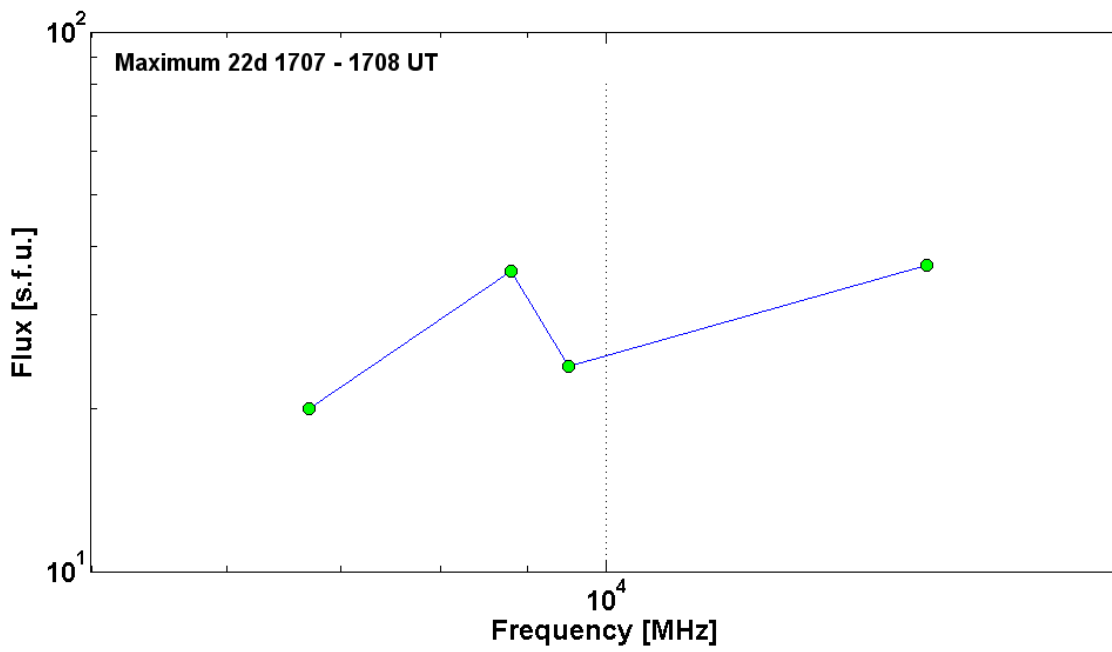
Sources: source unknown

Ø solar flare 22d17^h05^m, M1.4/SF, N19W44, AR8440

Main X-ray burst 1–8 Å: onset – 22d17^h 05^m, max – 22d17^h24^m, $\Phi = 0.015$ J/m²

CME: gap

1999	January 22	Ø		AR8440		To event 355	
H α	6563 Å	1708	1708	1715	N20W44	SF	
1 -12.5	keV	1705	1724	1736		M1.4	1.5E-2
22 – 32	keV	170809	170809	170821		36	Y
15.4	GHz	1707.0	1708.0	1709.0		1.57	
9.5	GHz	1706.9	1707.8	1709.3		1.38	
8.8	GHz	1707.0	1707.0	1709.0		1.56	
6.7	GHz	1706.9	1707.8	1709.4		1.30	
15.4	GHz	1717.0	1717.0	1722.0		1.76	
9.5	GHz	1717.0	1717.9	1721.0		1.84	
6.7	GHz	1716.7	1717.8	1723.3		1.93	
5	GHz	1716.0	1717.0	1722.0	P5	2.00	
2.7	GHz	1716.0	1717.0	1722.0		1.85	
1.4	GHz	1717.0	1717.0	1720.0		1.48	
610	MHz	1719.0	1719.0	1722.0		1.08	
CME							gap



PART 2. Event 1999.04.24 – (1999-114)

Particle event: To(Ep>10 MeV) – 24d15^h

Tmax₁(Ep>10 MeV) – 24d21^h, Jmax₁(Ep>10 MeV) – 3.7 /cm².s.sr

Tmax₂(Ep>10 MeV) – 25d06^h, Jmax₁(Ep>10 MeV) – 4.3 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 85 MeV

– Emax₂ = 210 MeV

Sources: ☐ back side solar flare event <13^h31^m, n22w90*, AR8517 3 days behind W limb

☑ CME:24d13^h31^m, V = 1495 km/s, Δφ = 360°, dA= 321°

1999 April 24 ☐ AR8517 To event 356

CME		1331	1495 km/s	37.1 km/s	360°	321°
Hα		No Flare			n22e90*	
1 - 12.5	keV	No	X-ray	Burst		

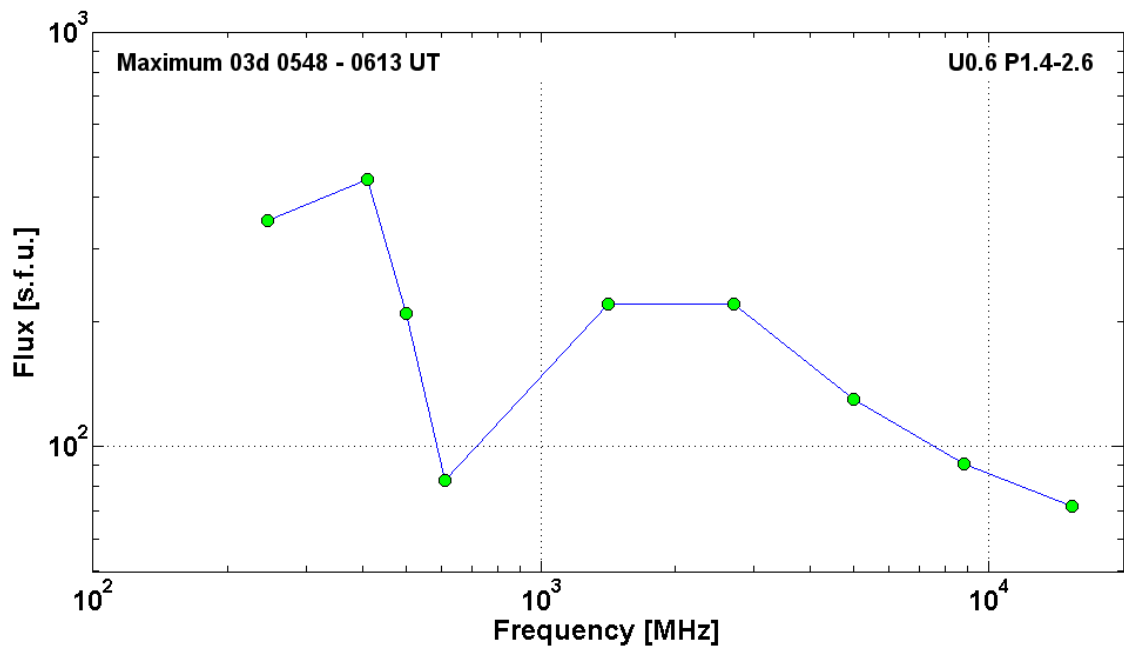
* – probable localization of the flare event

PART 2. Event 1999.05.04 – (1999-124)

Particle event: To(Ep>10 MeV) – 04d08^h
 Tmax₁(Ep>10 MeV) – 05d21^h, Jmax₁ (Ep>10 MeV) – 3.7 /cm².s.sr
 Tmax₂(Ep>10 MeV) – 06d06^h, Jmax₂ (Ep>10 MeV) – 4 /cm².s.sr
 Duration of the event – 4 days
 Maximum recorded proton energy of the event – Emax₁ = 75 MeV
 – Emax₂ = 65 MeV

Sources: ☉ solar flare 03d05^h36^m, M4.4/2N, N15E32, AR8525
 Main X-ray burst 1-8 Å: onset – 03d 05^h36^m, max – 03d 06^h 02^m, Φ = 0.099 J/m²
 CME: 03d06^h06^m, V = 1584 km/s, Δφ = 360°, dA = 088°
 ▲ SC 05d15^h 43^m

1999	May 03	☉	AR8525	To event 357			
Hα	6563Å	0543	0551	0745	N15 E32	2N	U
1 -12.5	keV	0536	0602	0632		M4.4	9.9E-2
23 – 33	keV	0602		0605		290	Y
15.4	GHz	0548.0	0608.0	0651.0		1.86	
8.8	GHz	0544.0	0607.0	0708.0		1.96	
5	GHz	0542.0	0607.0	0655.0		2.11	
2.7	GHz	0540.0	0548.0	0630.0		2.34	
1.4	GHz	0540.0	0548.0	0634.0		2.34	
610	MHz	0543.0	0551.0	0621.0		1.92	
500	MHz	0540.0	0552.0	0630.0		2.32	
410	MHz	0544.0	0551.0	0623.0		2.64	
245	MHz	0547.0	0613.0	0621.0	U0.6 P1.4-2.6	2.54	
DS II		0520		0606	35-85	3	
DS II	SH,H	0543		0612	25-180	2	
DS IV		<0551		~0710	40-800	2	
DS IV		0606		0709	35-85	3	
DS III	N	<0551		~1010	40-90	1	
DS DCIM	GG	0542		0641	800-2000	2	
CME		0606	1584 km/s	15.8 km/s ²	360°	088°	



PART 2. Event 1999.05.09 – (1999-129)

Particle event: To(Ep>10 MeV) – 09d19^h

Tmax(Ep>10 MeV) – 09d21^h, Jmax (Ep>10 MeV) – 1.2 /cm².s.sr *)

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 80 MeV

*) The data from IMP-8

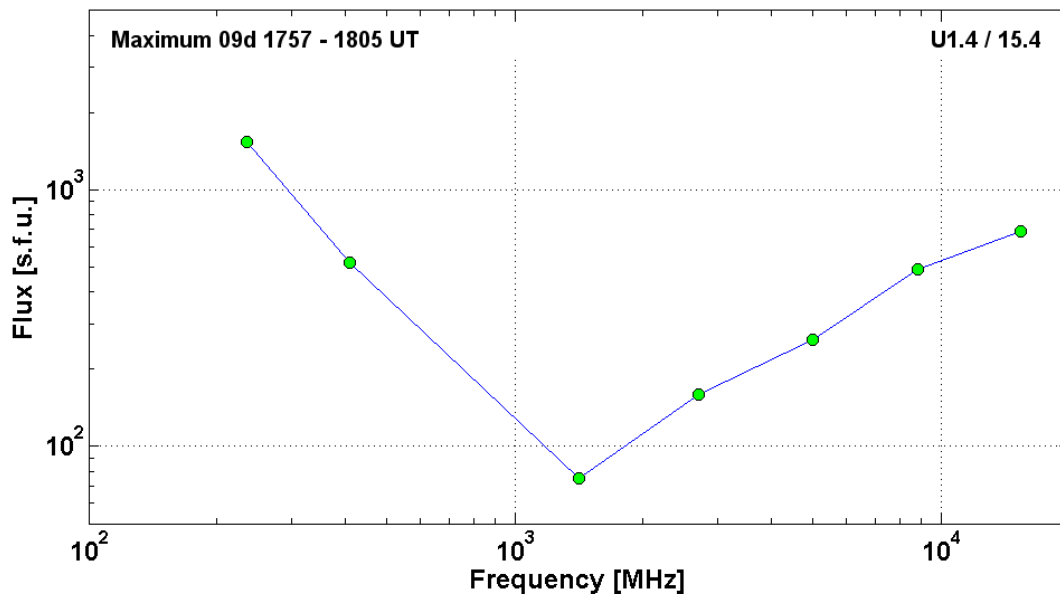
Sources: ■ solar flare 09d17^h53^m, M7.6/ ..., n23w90, AR8526 one day behind W limb;

Main X-ray burst 1-8 Å: onset – 09d17^h53^m, max – 09d18^h07^m, Φ = 0.061 J/m²

CME: 09d18^h27^m, V = 0615 km/s, Δφ = 172°, dA = 316°

1999	May 09	■			AR8526	To event 358	
Hα	6563Å	No Flare			n23 w90*		
1 -12.5	keV	1753	1807	1815		M7.6	6.1E-2
23 – 33	keV	1804		1821		1740	Y
>300	keV	175542	175751	180725		2204.41	B
>300	keV					2.1+/-0.1	O
15.4	GHz	1757.0	1757.0	1802.0		2.84	
8.8	GHz	1756.0	1757.0	1802.0		2.69	
5	GHz	1756.0	1758.0	1811.0	U1.4 / 15.4	2.41	
2.7	GHz	1757.0	1759.0	1801.0		2.20	
1.4	GHz	1757.0	1758.0	1800.0		1.88	
410	MHz	1804.0	1805.0	1805.0		2.72	
235	MHz	1800.3	1802.0	1803.0		3.19	
DS III		1803		1803	25-75	1	
CME		1827	0615 km/s	-3.0 km/s ²	172°	316°	

* – probable localization of the flare event



PART 2. Event 1999.05.27 – (1999-147)

Particle event: To(Ep>10 MeV) – 27d12^h

Tmax(Ep>10 MeV) – 13^h, Jmax (Ep>10 MeV) – 2.75 /cm².s.sr

Duration of the event – 1.5 days

Maximum recorded proton energy of the event – Emax = 280 MeV

Sources: ☐ back side flare event 27d<1106

☐ CME: 27d11^h06^m, V = 1691 km/s, Δφ = 360°, dA = 341°

○ solar flare 26d19^h15^m, M1.2/2N, N17E46, AR8552

1999	May 27		☐	AR8552	To event 359	
CME		1106		1691 km/s	-33.5 km/s	360° 341°

1999	May 26		○	AR8552	To event 359	
Hα		1917	1921	2026	N17 E46	2N FU
1 -12.5	keV	1915	1932	1945		M1.2 1.3E-02
6.7	GHz	1911.0	1934.0	2106.0		1.43
DS III	B	1955		1955	25-200	2
DS CONT		1954		2038	25-75	1
CME		2026	0396 km/s		017°	039°

PART 2. Event 1999.06.01 – (1999-152)

Particle event: To(Ep>10 MeV) – 01d20^h

Tmax₁(Ep>10 MeV) – 02d09^h, Jmax₁(Ep>10 MeV) – 23 /cm².s.sr

Tmax₂(Ep>10 MeV) – 02d21^h, Jmax₂(Ep>10 MeV) – 13 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 360 MeV

– Emax₂ = 240 MeV

Sources: ☐ back side solar flare 01d18^h53^m, C1.2/..., n25w90, AR unknown.

Main X-ray burst 1-8 Å: onset – 01d18^h 53^m, max – 01d19^h04^m, Φ = 0.0027 J/m²

CME: 01d19^h37^m, V = 1772 km/s, Δφ = 360°; dA=359°

1999	June 01	☐			AR	To event 360	
Hα	6563 Å	No Flare			n25w90		
1 -12.5	keV	1853	1904	1932		C1.2	2.7E-3
5	GHz	1855.0	1855.0	1856.0		1.75	
2.8	GHz	1852.0	1855.0	1931.0		1.26	2.8
CME		1938	1772 km/s	1.8 km/s ²	360°	359°	

PART 2. Event 1999.06.04 – (1999-155)

Particle event: To(Ep>10 MeV) – 04d08^h

Tmax(Ep>10 MeV) – 04d12^h, Jmax (Ep>10 MeV) – 20 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 300 MeV

Sources: • solar flare 04d06^h52^m, M3.9/2N, N18W72, AR8552

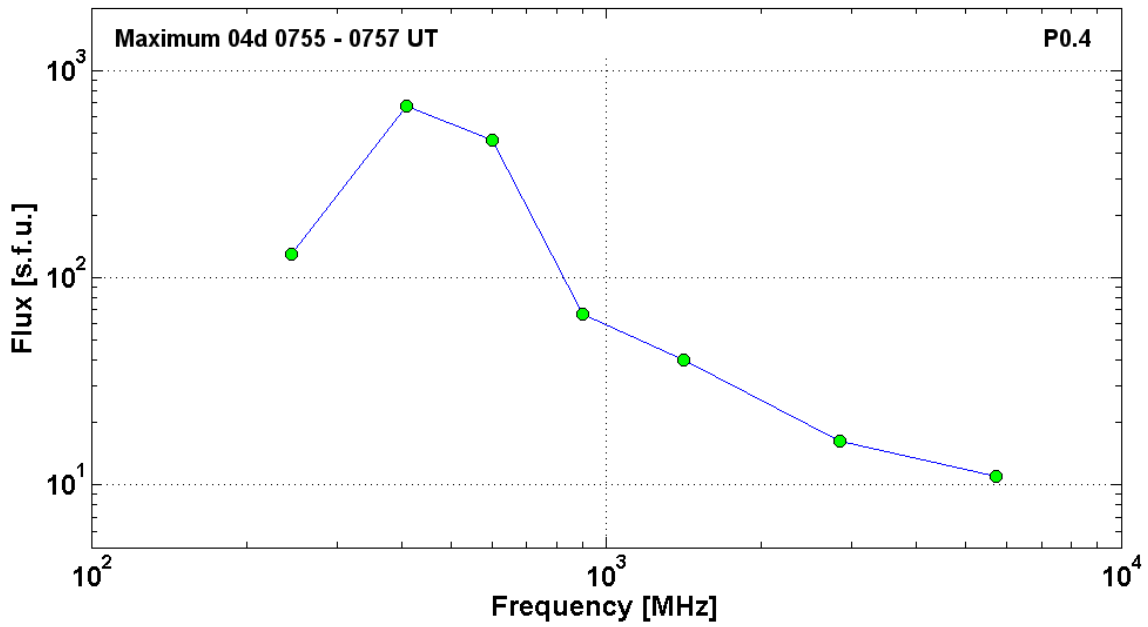
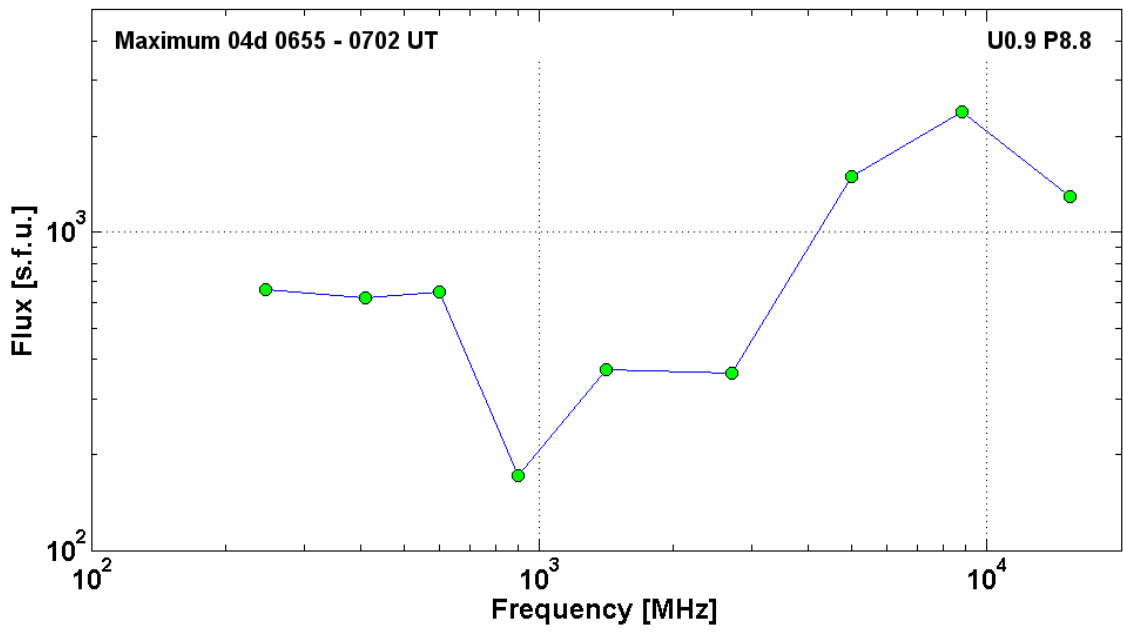
Main X-ray burst 1–8 Å: onset – 04d06^h52^m, max – 04d07^h03^m, Φ = 0.024 J/m²

CME: 04d07^h27^m, V = 2230 km/s, Δφ = 150 °, dA= 287°

1999 June 04 • AR8552 To event 361

H α	6563 Å	0655	0700	0716	N18 W72	2N	F
1 -12.5	keV	0652	0703	0711		M3.9	2.4E-2
>300	keV	065329	065958	071125		4242.30	B
15.4	GHz	0656.0	0700.0	0710.0		3.11	
8.8	GHz	0656.0	0700.0	0713.0	U0.9 P8.8	3.38	
5	GHz	0656.0	0700.0	0710.0		3.18	
2.7	GHz	0653.0	0701.0	0708.0		2.56	
1.4	GHz	0654.0	0659.0	0705.0		2.57	
900	MHz	0649.5	0659.1	0708.6		2.24	
600	MHz	0655.0	0700.7	0711.3		2.81	
410	MHz	0654.0	0702.0	0707.0		2.79	
245	MHz	0653.0	0655.0	0716.0		2.82	
DS II	FN	0704		0710	30-90	2	
DS II		0705		0716	50-150	3	
DS IV		0658		0728	35-85	3	
DS III	N	0652		~0721	45-270	2	
DS III	GG,RS	0654		0658	380-550	2	
DS DCIM	GG,FS	0652		0709	800-2000	2	
DS DCIM	P	0653		0700	270-550	2	
DS DCIM	GG	0653		0710	2000-4365	2	
5.7	GHz	0754.7	0756.9	0809.0		1.04	
2.8	GHz	0751.0	0755.0	0820.0		1.21	
1.4	GHz	0756.0	0757.0	0758.0		1.60	
900	MHz	0753.5	0756.1	0804.9		1.83	
600	MHz	0753.5	0756.2	0800.0		2.66	
410	MHz	0754.0	0756.0	0801.0	P0.4	2.83	
245	MHz	0754.0	0757.0	0758.0		2.11	
DS III	N	~0753		>1200	45-90	1	
DS DCIM	GG,FS	0754		0801	800-2000	2	
DS DCIM	P	0754		0759	290-550	1	
DS DCIM		0755		0800	2000-4355	1	

CME		0727	2230 km/s	-158.8 km/s	150°	287°	
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PART 2. Event 1999.06.11 – (1999-162)

Particle event: To(Ep>10 MeV) – 11d01^h

Tmax(Ep>10 MeV) – 11d03^h, Jmax (Ep>10 MeV) – 2.2 /cm².s.sr *)

Duration of the event – 10 hours

Maximum recorded proton energy of the event – Emax = 240 MeV

*) From CPME s/c IMP-8

Sources: □ solar flare 11d01^h05^m, C1.0/..., AR behind the W-limb

Main X-ray burst 1-8 Å: onset: – 11d01^h05^m, max – 11d01^h10^m, Φ = 0.00061 J/m²

CME: 11d01^h27^m, V = 0719 km/s, Δφ = 101°, dA = 288°

1999	June 11	□	AR	To event 362		
Hα	6563 Å	No Flare				
1 -12.5	keV	0105	0110	0116	C1.0	6.1E-04
1.4	GHz	0038.0	0038.0	0039.0		1.61
245	MHz	0039.0	0039.0	~0039.0		1.74
DS II	SH,H	0039		0049	50-250	3
DS II	FN,H	0039		0049	30-130	3
DS IV		0051		0116	25-75	1
DS III	B	0041		0042	20-150	2
410	MHz	0109.0	0109.0	0110.0		2.34
245	MHz	0109.0	0109.0	0110.0		2.23
DS III		0103		0104	30-55	1
CME		0127	0719 km/s	-38.2 km/s	101°	262°

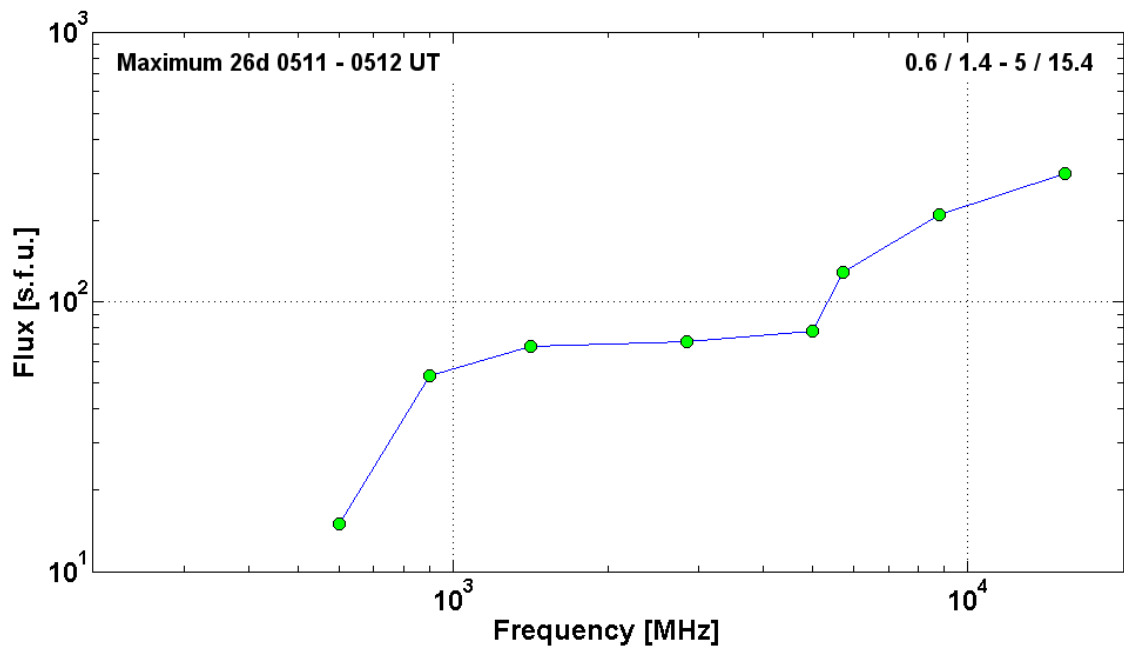
PART 2. Event 1999.06.25 – (1999-176)

Particle event: To(Ep>10 MeV) – 25d10^h
 Tmax(Ep>10 MeV) – 26d12^h, Jmax(Ep>10 MeV) – 1.7 /cm².s.sr *)
 Duration of the event – 3 days *) The data from IMP-8
 Maximum recorded proton energy of the event – Emax = 40 MeV

Sources: O solar flare 24d12^h04^m, C4.1/1F, N29W13, AR8595
 Ø solar flare 26d05^h08^m, M2.3/2B, N24E02, AR8598
 Main X-ray burst 1-8 Å: onset – 24d12^h04^m, max – 24d14^h12^m, Φ = 0.004 J/m²
 CME: 24d13^h31^m, V = 0975 km/s, Δφ = 360°, dA = 335°
 ▲ SC 26d03^h25^m, 20^h16^m

1999	June 24		O		AR8595		To event 363
Hα	6563 Å	<1321	1342	1444	N29W13	1F	SU
1 -12.5	keV	1204	1412	1510		C4.1	4.0E-3
6.7	GHz	1330.0	1420.0	1523.0		1.05	
280	MHz	<1300.0					
235	MHz	<1300.0					
33	MHz	1421.0					
CME		1331	0975 km/s	32.4 km/s	360°	335°	

1999	June 26		Ø		AR8598		To event 363
Hα	6563 Å	0505	0512	0538	N24E02	2B	EF
1 -12.5	keV	0508	0512	0514		M2.3	3.9E-3
15.4	GHz	0511.0	0511.0	0512.0	0.6/1.4 - 5/15.4	2.48	
8.8	GHz	0511.0	0511.0	0512.0		2.32	
5.7	GHz	0510.4	0511.9	0521.0		2.11	
5	GHz	0511.0	0511.0	0512.0		1.89	
2.8	GHz	0503.0	0512.0	0514.0		1.85	
1.4	GHz	0511.0	0512.0	0512.0		1.83	
900	MHz	0511.5	0512.3	0512.7		1.72	
600	MHz	0511.3	0512.3	0512.9		1.18	
DS III		0511		0512	450-550	1	
DS DCIM	GG	0511		0512	800-2000	2	
CME		0731	0558 km/s	-9.8 km/s ²	360°	021°	



PART 2. Event 1999.11.17 – (1999-321)

Particle event: To(Ep>10 MeV) – 17d19^h

Tmax₁(Ep>10 MeV) – 19d02^h, Jmax₁(Ep>10 MeV) – 1 /cm².s.sr *)

Tmax₂(Ep>10 MeV) – 19d23^h, Jmax₂(Ep>10 MeV) – 0.4 /cm².s.sr *)

Duration of the event – 2.5 days

Maximum recorded proton energy of the event – Emax₁ = 50 MeV

– Emax₂ = 30 MeV

*) The data from IMP-8

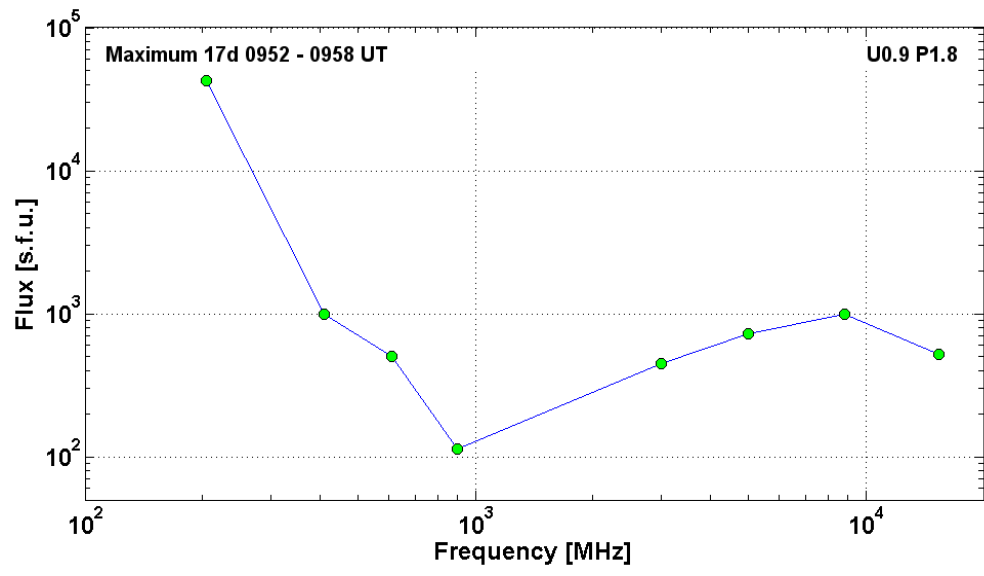
Sources: • solar flare 17d09^h47^m, M7.4/2B, N17E21, AR8766

Main x-ray burst 1-8 Å: onset – 17d09^h 47^m, max – 17d09^h 57^m, Φ = 0.04 J/m²

CME: gap

1999 November 17 • AR8766 To event 364

Hα	6563 Å	0951	0955	>1024	N17E21	2B	E
1 -12.5	keV	0947	0957	1002		M7.4	4.0E-2
15.4	GHz	0952.0	0953.0	1002.0		2.72	
8.8	GHz	0951.0	0953.0	1007.0	U0.9 P1.8	3.00	
5	GHz	0950.0	0954.0	0959.0		2.86	
3	GHz	0951.1	0957.2	1006.6		2.65	
900	MHz	0951.2	0952.9	1006.9		2.05	
610	MHz	0951.0	0958.0	1002.0		2.70	
410	MHz	0951.0	0953.0	0959.0		3.00	
204	MHz	0951.9	0952.5	1006.8		4.63	
DS II		0959		1005	30-80	2	
DS IV		0951		1403	35-85	3	
DS III		0951		0958	30-80	3	
DS DCIM	GG	0951		1000	800-2000	2	
CME							gap



PART 2. Event 2000.02.18 – (2000-049)

Particle event: To(Ep>10 MeV) – 18d06^h

Tmax(Ep>10 MeV) – 18d12^h, Jmax (Ep>10 MeV) – 1.7 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 290 MeV

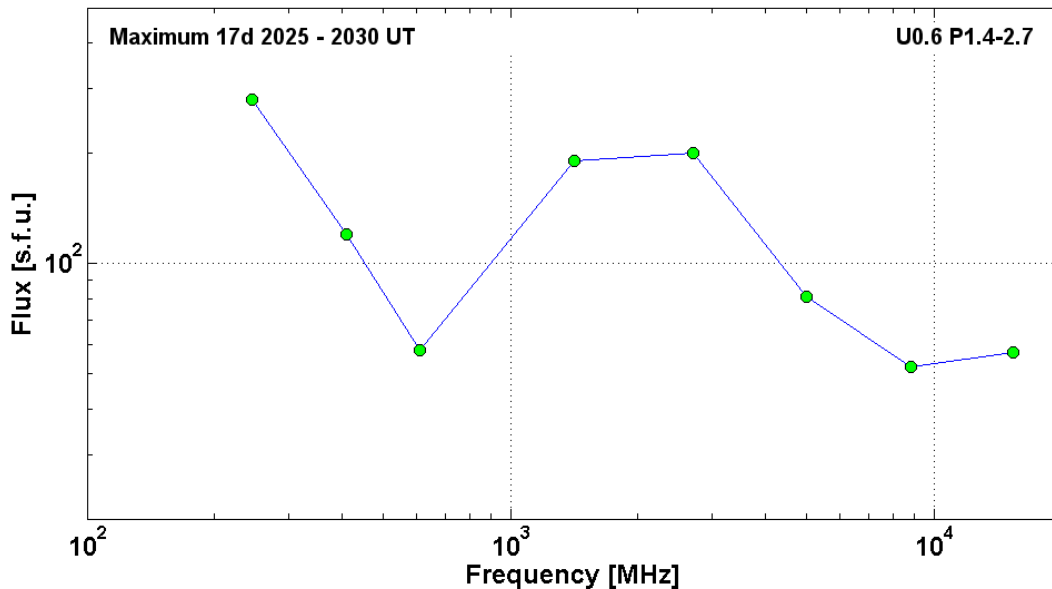
Sources: ☉ solar flare 17d20^h17^m, M1.3/2N, S29E07, AR8872

☽ solar flare 17d18^h41^m, M2.5/1B, S25W16, AR8869

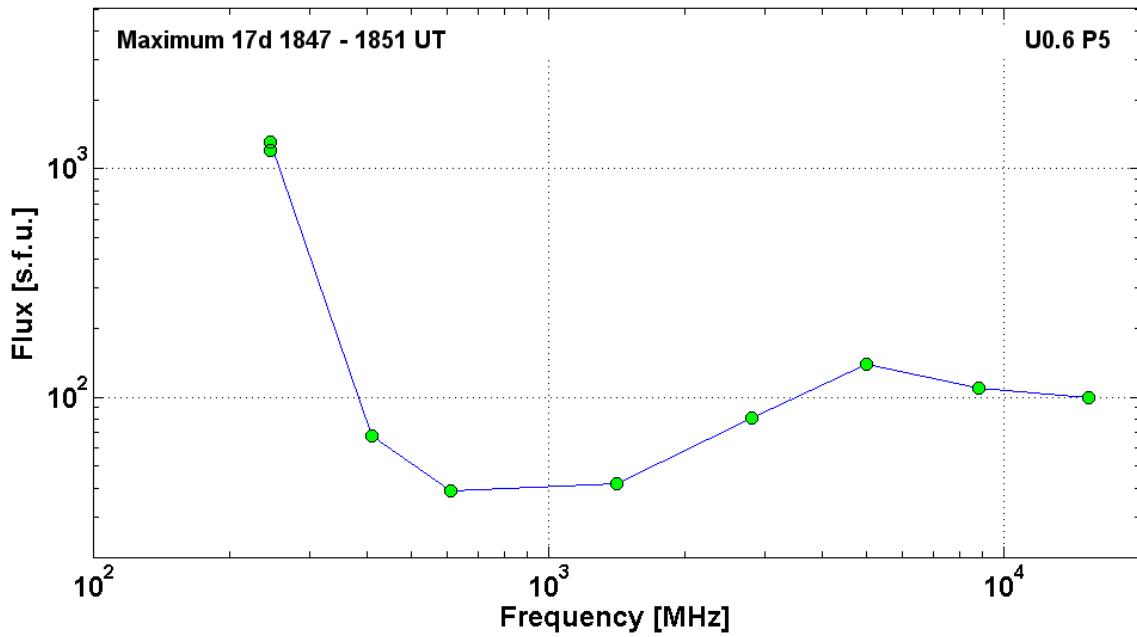
Main X-ray burst 1-8 Å: onset – 17d20^h17^m, max – 17d20^h35^m, Φ = 0.027 J/m²

CME: 17d21^h30^m, V = 728 km/s, Δφ = 360°; dA=184°;

2000	February 17	☉			AR8872	To event 365	
Hα	6563 Å	2031	2045	2218	S29E07	2N	FSU
1 -12.5	keV	2017	2035	2107		M1.3	2.7E-02
15.4	GHz	2024.0	2030.0	2034.0		1.76	
8.8	GHz	2024.0	2028.0	2039.0		1.72	
5	GHz	2024.0	2028.0	2039.0		1.91	
2.7	GHz	2023.0	2025.0	2039.0	U0.6 P1.4-2.7	2.30	
1.4	GHz	2023.0	2028.0	2039.0		2.28	
610	MHz	2024.0	2029.0	2039.0		1.76	
410	MHz	2024.0	2028.0	2039.0		2.08	
245	MHz	2024.0	2030.0	2039.0		2.45	
DS II	SH	2025		2040	26-180	3	
DS III		2024		2040	25-75	3	
CME		2130	0728 km/s	-22.9 km/s	360°	184	



2000	February 17	Ø			AR8869	To event 365	
H α	6563 Å	1844	1847	1938	S25W16	1B	FU
1 -12.5	keV	1841	1852	1905		M2.5	2.3E-2
15.4	GHz	1844.0	1849.0	1859.0		2.00	15.4
8.8	GHz	1847.0	1848.0	1855.0		2.04	8.8
5	GHz	1846.0	1848.0	1855.0	U0.6 P5	2.15	5
2.8	GHz	1836.0	1848.0	~1932.0		1.91	2.8
1.4	GHz	1847.0	1847.0	1855.0		1.62	1.4
610	MHz	1847.0	1848.0	1855.0		1.59	610
410	MHz	1847.0	1847.0	1850.0		1.83	410
245	MHz	1849.0	1851.0	1852.0		3.11	245
245	MHz	1849.0	1851.0	1852.0		3.08	245
DS II		1852		1905	25-75	2	DS II
CME		1931	0543 km/s	-82.5 km/s	064°	184°	



PART 2. Event 2000.04.04 – (2000-095)

Particle event: To(Ep>10 MeV) – 04d17^h

Tmax₁(Ep>10 MeV) – 5d02^h, Jmax₁ (Ep>10 MeV) – 25 /cm².s.sr

Tmax₂(Ep>10 MeV) – 6d06^h, Jmax₂ (Ep>10 MeV) – 4 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 110 MeV

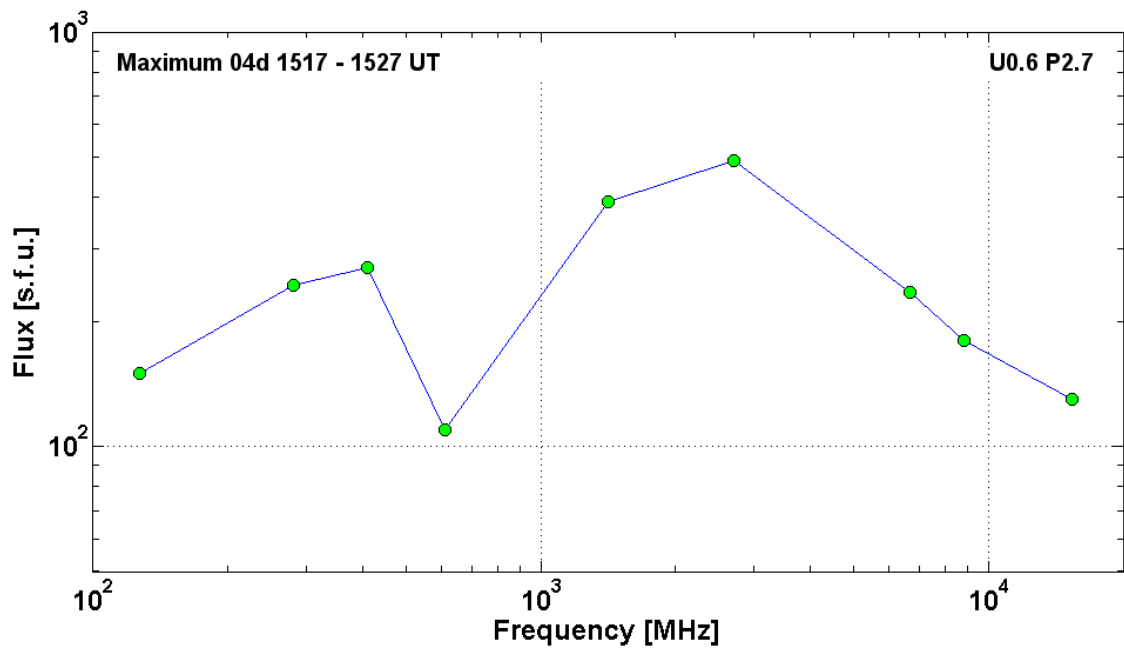
– Emax₂ = 80 MeV

Sources: • solar flare 04d15^h11^m, C9.7/2F, N16W66, AR8933

Main X-ray burst 1-8 Å: onset – 04d15^h12^m, max – 04d15^h41^m, Φ = 0.023 J/m²

CME: 04d16^h33^m, V = 1188 km/s, Δφ = 360°, dA = 265°

2000	April 04	•	AR8933	To event 366			
Hα	6563 Å	1512	1533	1724	N16W66	2F	FS
1 -12.5	keV	1512	1541	1605		C9.7	2.3E-02
>300	keV	1523				8.7	O
15.4	GHz	1517.0	1526.0	1552.0		2.11	
8.8	GHz	1517.0	1527.0	1552.0		2.26	
6.7	GHz	1516.3	1526.2	1543.2		2.37	
2.7	GHz	1517.0	1519.0	1552.0	U0.6 P2.7	2.69	
1.4	GHz	1515.0	1524.0	1542.0		2.59	
610	MHz	1516.0	1518.0	1551.0		2.04	
410	MHz	1516.0	1518.0	1552.0		2.43	
280	MHz	1507.9	1522.0	1555.0		2.39	
127	MHz	1516.1	1517.8	1534.1		>2.18	
DS II	SH	1524		1526	110-170	3	
DS II	F,H	1530		1531	40-80	3	
DS IV		1515		1619	35-85	3	
DS IV	P	1517		1527	40-550	3	
DS III	N	1516		1539	30-80	3	
DS DCIM	GG	1514		1542	800-2000	2	
DS DCIM	GG	1517		1543	2000-4500	2	
CME		1633	1188 km/s	12.8 km/s	360°	265°	



PART 2. Event 2000.06.07 – (2000-159)

Particle event: To(Ep>10 MeV) – 07d00^h

Tmax(Ep>10 MeV) – 8d10^h, Jmax (Ep>10 MeV) – 54 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 100 MeV

Sources: • solar flare 06d11^h25^m, X2.3/3B, N20E14, AR9026*

06d13^h10^m, M2.7/3B, N20E14, AR9026*

06d13^h30^m, X1.1/3B, N20E14, AR9026*

06d13^h56^m, M7.1/3B, N20E14, AR9026*

06d14^h58^m, X2.3/3B, N20E14, AR9026*

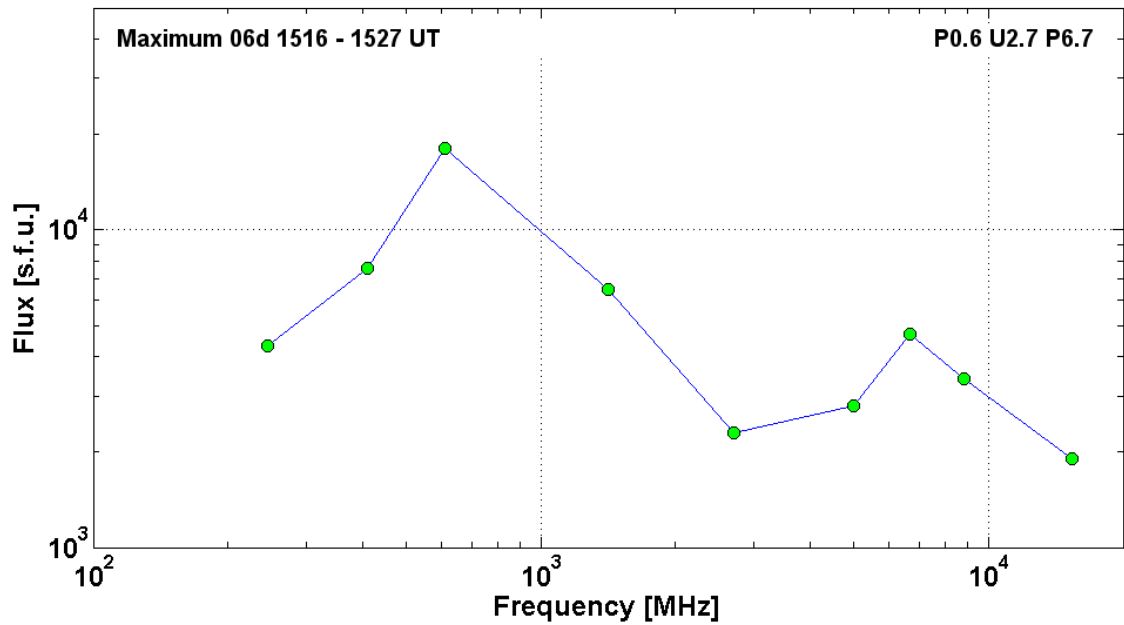
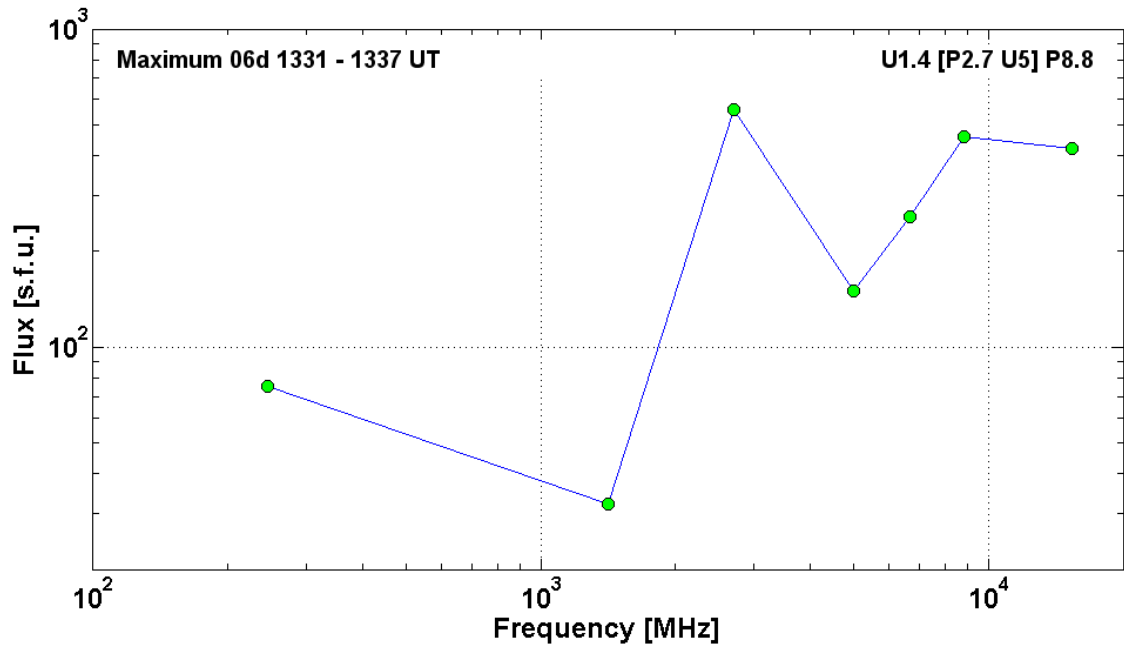
Main X-ray burst 1–8 Å: onset – 06d14^h 28^m, max – 06d15^h25^m, Φ = 0.36 J/m²

CME: 06d15^h54^m, V = 1119 km/s, Δφ = 360°, dA = 047°

* One flare event with four X-ray bursts

2000	June 06	•	AR9026	To event 367			
Hα	6563 Å	1125	1317	1450	N20E13	2N	EFHKL
Hα	6563 Å	1206	1521	1841	N20E14	3B	UZ
1 -12.5	keV	1310	1319	1328		M2.7	1.9E-2
1 -12.5	keV	1330	1339	1346		X1.1	8.1E-2
1 -12.5	keV	1356	1401	1411		M7.1	5.0E-2
1 -12.5	keV	1458	1525	1540		X2.3	3.6E-1
53 - 93	keV	<1543	1548	>1556	199		Y
15.4	GHz	1330.0	1332.0	1349.0		2.62	
8.8	GHz	1330.0	1332.0	1338.0	U1.4 [P2.7 U5] P8.8	2.66	
6.7	GHz	1330.8	1331.2	1333.8		2.41	
5	GHz	1330.0	1333.0	1338.0		2.18	
2.7	GHz	1332.0	1333.0	1338.0		2.75	
1.4	GHz	1333.0	1334.0	1336.0		1.51	
245	MHz	1336.0	1337.0	1338.0		1.88	
DS III	N	1322		1449	35-70	1	
DS DCIM	GG,SP	1331		1334	2000-4500	2	
15.4	GHz	1508.0	1519.0	0000.0		3.28	
8.8	GHz	1508.0	1519.0	0000.0		3.53	
6.7	GHz	1505.0	1516.5	1536.6	P0.6 U2.7 P6.7	3.67	
5	GHz	1506.0	1519.0	0000.0		3.45	
2.7	GHz	1506.0	1519.0	0000.0		3.36	
1.4	GHz	1506.0	1519.0	0000.0		3.81	
610	MHz	1507.0	1523.0	0000.0		4.26	
410	MHz	1507.0	1521.0	0000.0		3.88	
245	MHz	1507.0	1527.0	1607.0		3.63	
DS II		1516		~1530	220-550	3	
DS II		1528		1539	25-119	2	

DS IV		1457		2121	30-80	3	
DS III	GG,RS	1507		1509	220-550	3	
DS III		1507		1509	25-158	1	
DS DCIM	GG	1503		1553	2000-4500	3	
DS DCIM	P,Z	1520		1710	400-4000	3	
CME		1506	0358 km/s	-3.9 km/s	051°	018°	
CME		1530	0929 km/s	111.9 km/s ²	090°	004°	
CME		1554	1119 km/s	1.5 km/s ²	360°	047°	



PART 2. Event 2000.06.10 – (2000-162)

Particle event: To(Ep>10 MeV) – 10d17^h

Tmax(Ep>10 MeV) – 10d20^h, Jmax (Ep>10 MeV) – 24/cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax = 400 MeV

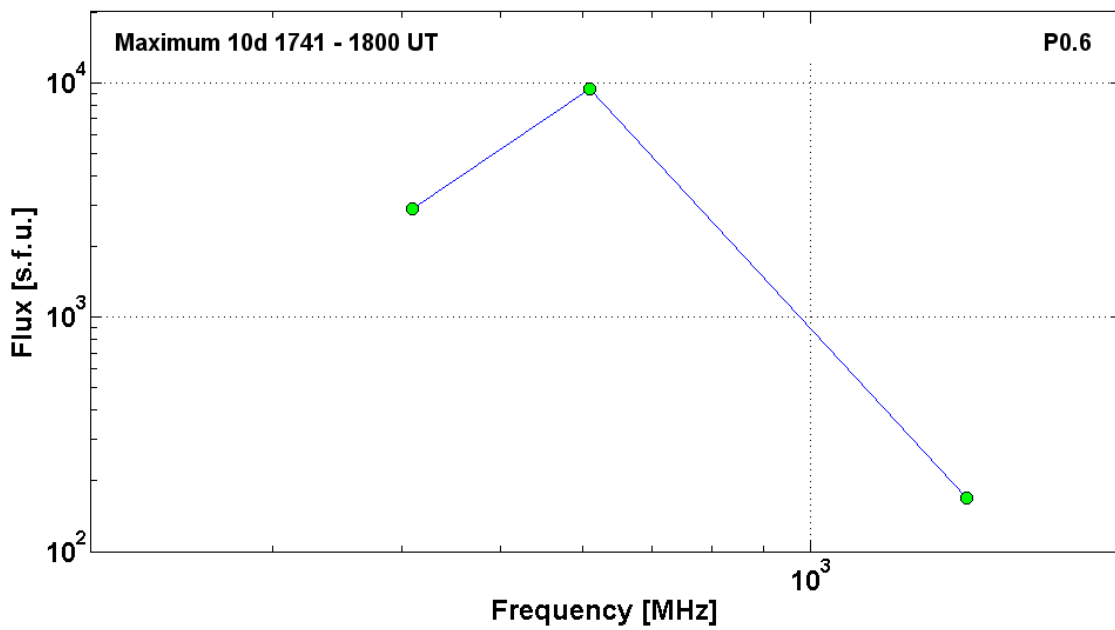
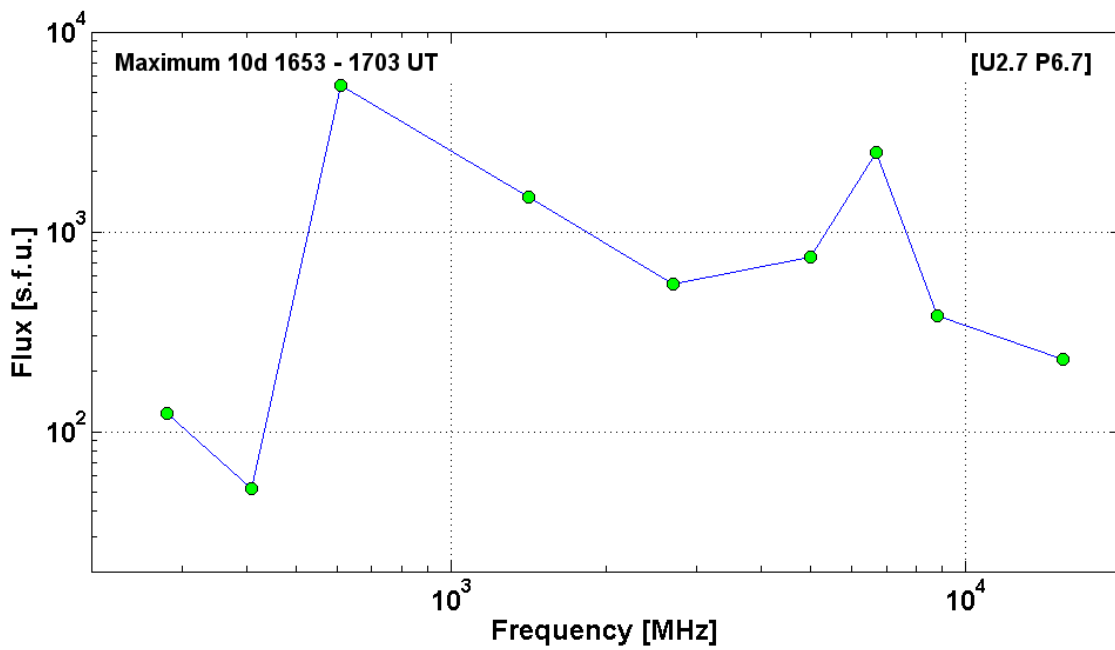
Sources: • solar flare 10d16^h22^m, M5.2/3B, N22W39, AR9026

Main X-ray burst 1-8 Å: onset – 10d16^h40^m, max – 10d17^h02^m, Φ = 0.073 J/m²

CME: 10d17^h08^m, V = 1108 km/s, Δφ = 360°, dA = 307°

▲ SC 11d08^h01^m, ▲ SC 12d22^h08^m

2000	June 10	•	AR9026	To event 368			
Hα	6563 Å	1622	1653	1810	N22W39	3B	FUY
1 -12.5	keV	1640	1702	1719		M5.2	7.3E-2
53 – 93	keV	<1652	1653	1715		18	Y
15.4	GHz	1647.0	1653.0	0000.0		2.36	
8.8	GHz	1648.0	1653.0	0000.0		2.58	
6.7	GHz	1647.0	1653.1	1658.1	[U2.7 P6.7]	3.40	
5	GHz	1648.0	1653.0	0000.0		2.88	
2.7	GHz	1648.0	1653.0	0000.0		2.74	
2.7	GHz	1648.0	1653.0	0000.0		2.74	
1.4	GHz	1647.0	1653.0	1706.0		3.18	
610	MHz	1653.0	1700.0	1708.0		3.73	
410	MHz	1652.0	1700.0	1703.0		1.72	
280	MHz	1653.3	1703.0	1710.1		2.09	
DS II		1655		1714	25-180	2	
DS II		1655		1718	30-80	3	
DS III		1655		1659	25-180	1	
DS DCIM	P,C	1647		1716	1000-4000	3	
1.4	GHz	1756.0	1800.0	1819.0		2.23	
610	MHz	1737.0	1741.0	0000.0	P0.6	3.97	
410	MHz	1738.0	1741.0	0000.0		3.46	
DS DCIM	P,Z	1757		1806	1000-1500	3	
CME		1708	1108 km/s	-21.2km/s ²	360°	307°	



PART 2. Event 2000.06.17 – (2000-169)

Particle event: To(Ep>10 MeV) – 17d07^h

Tmax(Ep>10 MeV) –18d06^h, Jmax (Ep>10 MeV) – 1.7 /cm².s.sr *)

Duration of the event – 2 days *)

Maximum recorded proton energy of the event – Emax = 110 MeV

*) According to data IMP-8 (CPME)

Sources: ● solar flare 17d02^h25^m, M3.5/2B, N22W72, AR9033

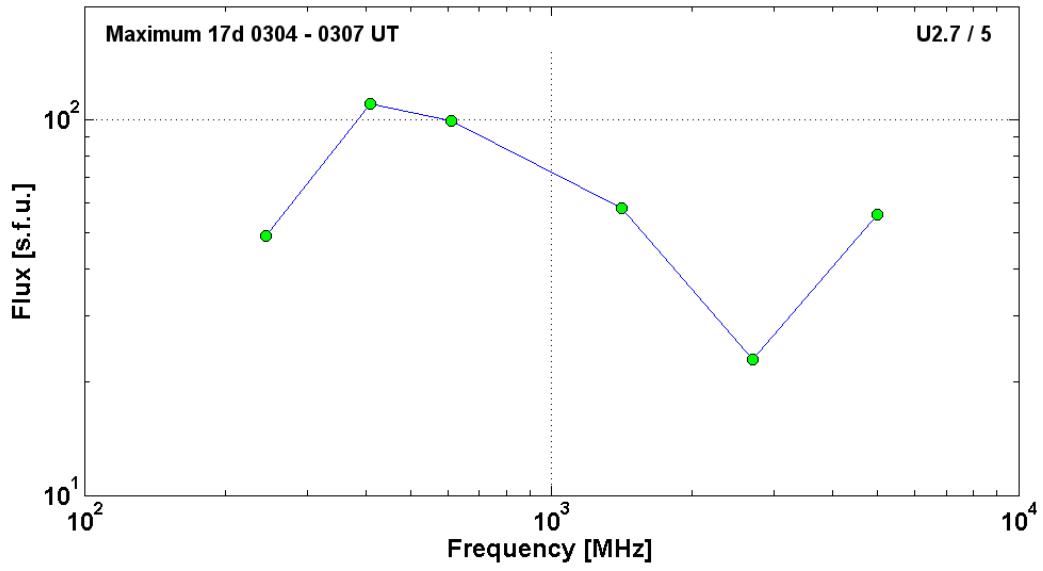
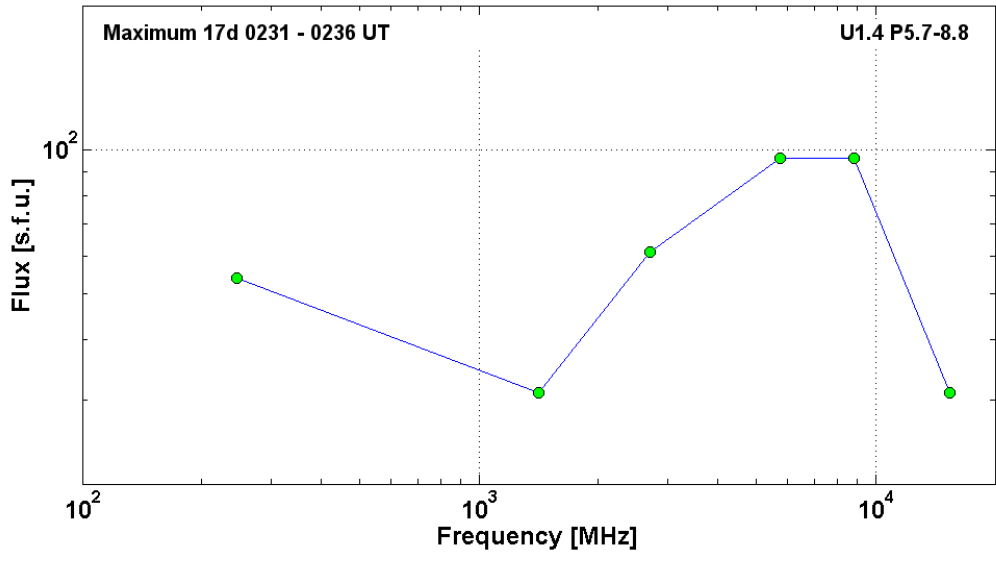
∅ solar flare 18d01^h52^m, X1.0/SF, N23W85, AR9033

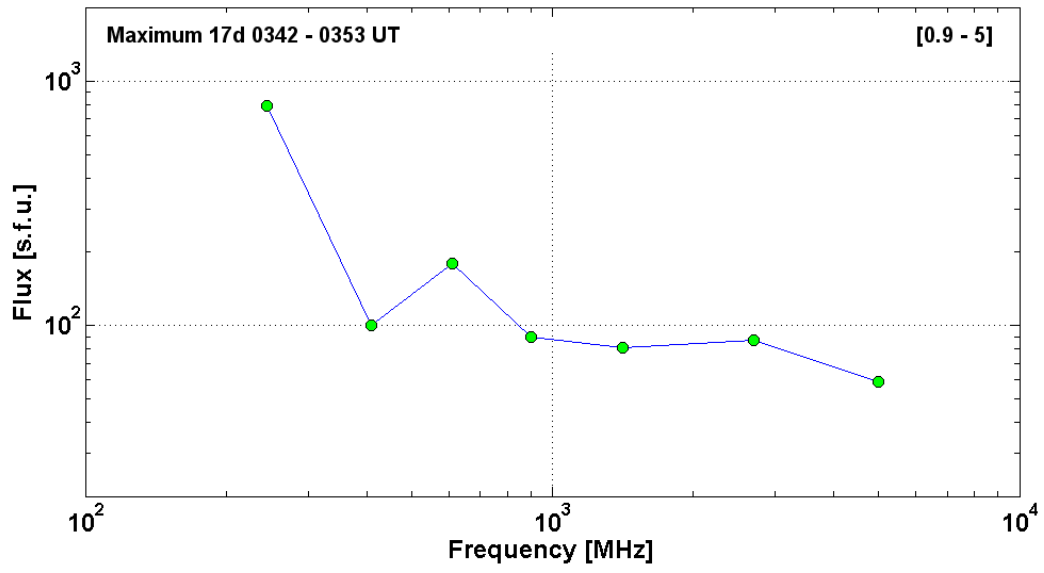
Main X-ray burst 1-8 Å : onset – 17d02^h25^m, max – 17d02^h 37^m, Φ = 0.024 J/m²

CME: 17d03^h28^m, V = 857 km/s, Δφ = 133°, dA=301°;

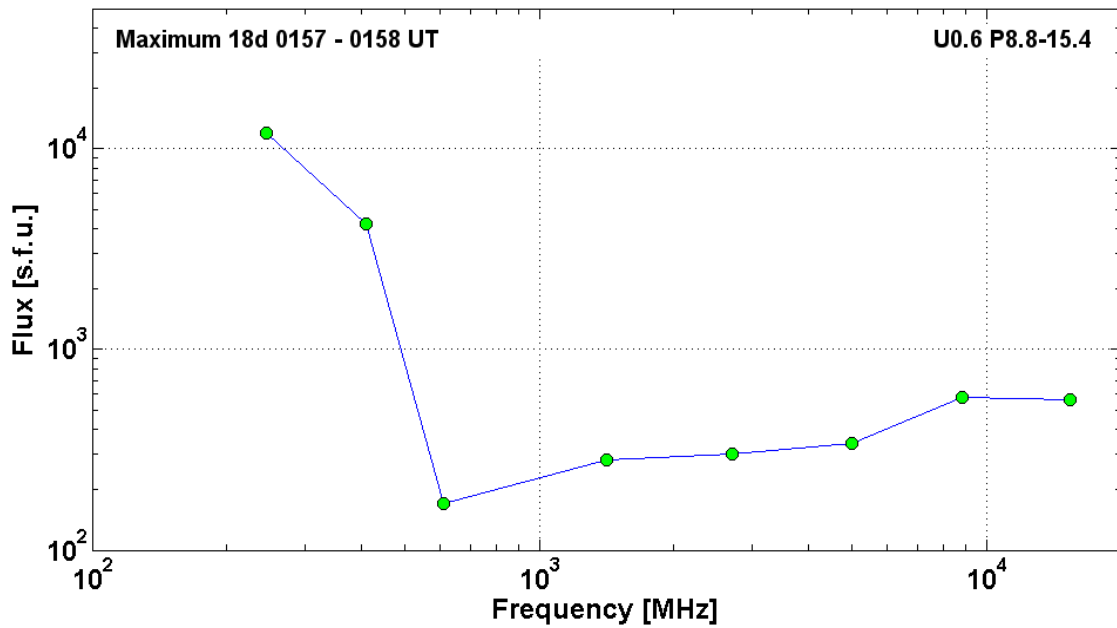
2000 June 17 ● AR9033 To event 369

Hα	6563 Å	0228	0238	0501	N22W72	2B	EF
1 -12.5	keV	0225	0237	0244		M3.5	2.4E-2
50 – 150	keV	0228	0235	0337		206	Y
15.4	GHz	0231.0	0231.0	0232.0		1.49	
8.8	GHz	0230.0	0231.0	0235.0	U1.4 P5.7-8.8	1.98	
5.7	GHz	0230.3	0232.0	0405.0		1.98	
2.7	GHz	0231.0	0233.0	0235.0		1.79	
1.4	GHz	0231.0	0234.0	0235.0		1.49	
245	MHz	0236.0	0236.0	~0236.0		1.73	
DS III	N	0247		0332	25-150	2	
DS CONT		0250		0413	30-80	1	
5	GHz	0258.0	0305.0	0310.0	U2.7 / 5	1.75	
2.7	GHz	0307.0	0307.0	~0307.0		1.36	
1.4	GHz	0305.0	0307.0	0309.0		1.76	
610	MHz	0306.0	0307.0	0309.0		2.00	
410	MHz	0306.0	0307.0	0308.0		2.04	
245	MHz	0304.0	0304.0	~0304.0		1.69	
DS III	GG	0301		0309	23-600	3	
5	GHz	0353.0	0353.0	0354.0	[0.9 - 5]	1.77	
2.7	GHz	0351.0	0352.0	0356.0		1.94	
1.4	GHz	0346.0	0346.0	0347.0		1.91	
900	MHz	0345.0	0352.2			1.95	
610	MHz	0345.0	0352.0	0357.0		2.26	
410	MHz	0345.0	0347.0	0349.0		2.00	
245	MHz	0340.0	0342.0	0000.0		2.90	
DS III	G	0340		0346	160-260	2	
DS CONT		0341		0355	160-820	1	
CME		0328	0857 km/s	16.4 km/s ²	133°	301°	





2000	June 18	Ø			AR9033	To event 369	
H α	6563 Å	0156	0157	0213	N23W85	SF	EF
1 -12.5	keV	0152	0159	0213		X1.0	3.4E-2
53 - 93	keV	>020422	~020426	020912		188	Y
15.4	GHz	0156.0	0157.0	0158.0	U0.6 P8.8-15.4	2.75	
8.8	GHz	0156.0	0157.0	0158.0		2.76	
5	GHz	0155.0	0157.0	0159.0		2.53	
2.7	GHz	0155.0	0157.0	0159.0		2.48	
1.4	GHz	0156.0	0157.0	0200.0		2.45	
610	MHz	0156.0	0157.0	0200.0		2.23	
410	MHz	0157.0	0158.0	0200.0		3.62	
245	MHz	0156.0	0158.0	0203.0		4.08	
DS II	FN	0157		0211	30-650	3	
DS III	GG	0157		0204	18-180	3	
BSL	6563 Å	0156		0233	N17W90		
CME		0210	0629 km/s	-1.2 km/s ²	132°	318°	



PART 2. Event 2000.06.25– (2000-177)

Particle event: To(Ep>10 MeV) – 25d10^h

Tmax(Ep>10 MeV) – 26d07^h, Jmax (Ep>10 MeV) – 1.5 /cm².s.sr

Duration of the event – 3 days

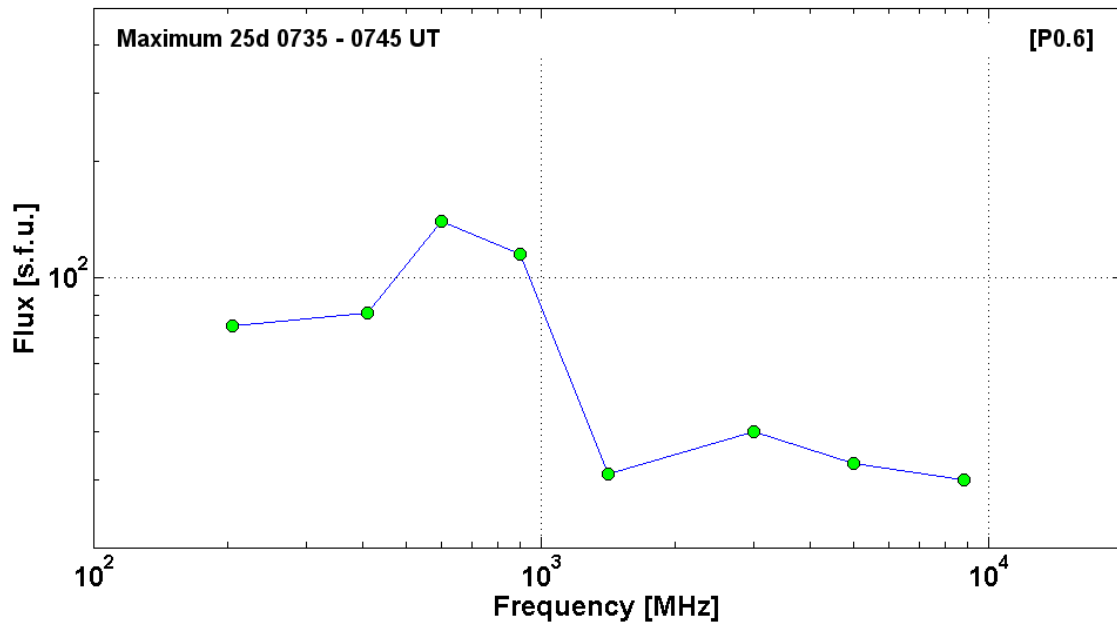
Maximum recorded proton energy of the event – Emax = 70 MeV

Sources: ☉ solar flare 25d07^h17^m, M1.9/2N, N16W55, AR9046

Main X-ray burst 1–8 Å : onset – 25d07^h 17^m, max – 25d07^h52^m, Φ = 0.043 J/m²

CME: 25d07^h54^m, V = 0546 km/s, Δφ = 165°, dA = 274°

2000	June 25	☉		AR9046		To event 370	
Hα	6563 Å	0720	0741	0853	N16W55	2N	FH
1 -12.5	keV	0717	0752	0821		M1.9	4.3E-02
3	GHz	0716.2	0720.8	0726.8		1.49	
245	MHz	0719.0	0720.0	0721.0		1.82	
204	MHz	0720.2	0720.6	0721.5		2.16	
DS III	GG,S	0720		0721	220-450	3	
DS III	GG	0720		0721	50-270	2	
DS DCIM	G	0720		0721	2088-4500	1	
8.8	GHz	0741.0	0741.0	0000.0		1.48	
5	GHz	0740.0	0741.0	0744.0		1.52	
3	GHz	0733.9	0741.6	0801.4		1.60	
1.4	GHz	0741.0	0741.0	0742.0		1.49	
900	MHz	0715.0	0735.6			2.06	
600	MHz	0719.5	0738.6		[P0.6]	2.15	
410	MHz	0740.0	0741.0	0742.0		1.91	
204	MHz	0736.8	0745.8	0752.0		1.88	
DS II		0751		0759	40-90	2	
DS I	N,C	0738		~0804	50-160	2	
DS III	N	0742		~0808	45-95	2	
DS CONT		0739		0805	25-180	1	
DS DCIM	GG,SP	0730		0746	800-2000	2	
DS DCIM	C	0734		0747	220-550	2	
CME		0754	1617 km/s	-17.5 km/s ²	165°	274°	



PART 2. Event 2000.07.13 – (2000-195)

Particle event: To(Ep>10 MeV) – 13d06^h

Tmax(Ep>10 MeV) – 13d10^h, Jmax (Ep>10 MeV) – 5 /cm².s.sr

Duration of the event – 1.5 days

Maximum recorded proton energy of the event – Emax = 40 MeV

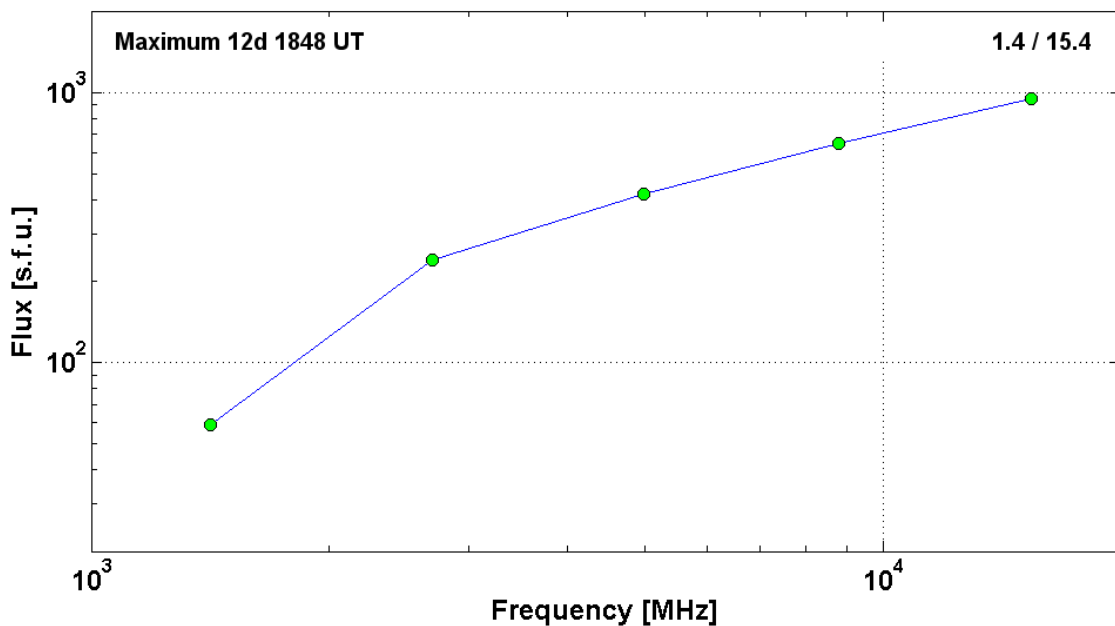
Sources: ☉ solar flare 12d18^h41^m, M5.7/2F, N16W64, AR9070

Main X-ray burst 1-8 Å : onset – 12d18^h41^m, max – 12d18^h49^m, Φ = 0.063 J/m²

CME: 12d20^h30^m, V = 820 km/s, Δφ = 101°, dA = 281°

▲ SC 13d09^h42^m

2000	July 12		☉	AR9070		To event 371	
Hα	6563 Å	<1849	1848	>1957	N16W64	2F	
1 -12.5	keV	1841	1849	1907		M5.7	6.3E-2
15.4	GHz	1841.0	1848.0	1858.0	1.4 / 15.4	2.98	
8.8	GHz	1843.0	1848.0	1853.0		2.81	
5	GHz	1843.0	1848.0	1855.0		2.62	
2.7	GHz	1843.0	1848.0	1853.0		2.38	
1.4	GHz	1844.0	1848.0	1852.0		1.77	
DS III		1848		1849	25-86	1	
CME		2030	0820 km/s	-3.2 km/s ²	101°	281°	



PART 2. Event 2000.07.14 – (2000-196) – GLE-59

Particle event: To(Ep>10 MeV) – 14d10^h

Tmax₁(Ep>10 MeV) – 14d18^h, Jmax₁(Ep>10 MeV) – 7.2·10³ cm².s.sr

Tmax₂(Ep>10 MeV) – 15d13^h, Jmax₂(Ep>10 MeV) – 1.8·10⁴ cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 2650 MeV

– Emax₂ = 530 MeV

Sources: ● solar flare 14d10^h03^m, X5.7/3B, N22W07, AR9077

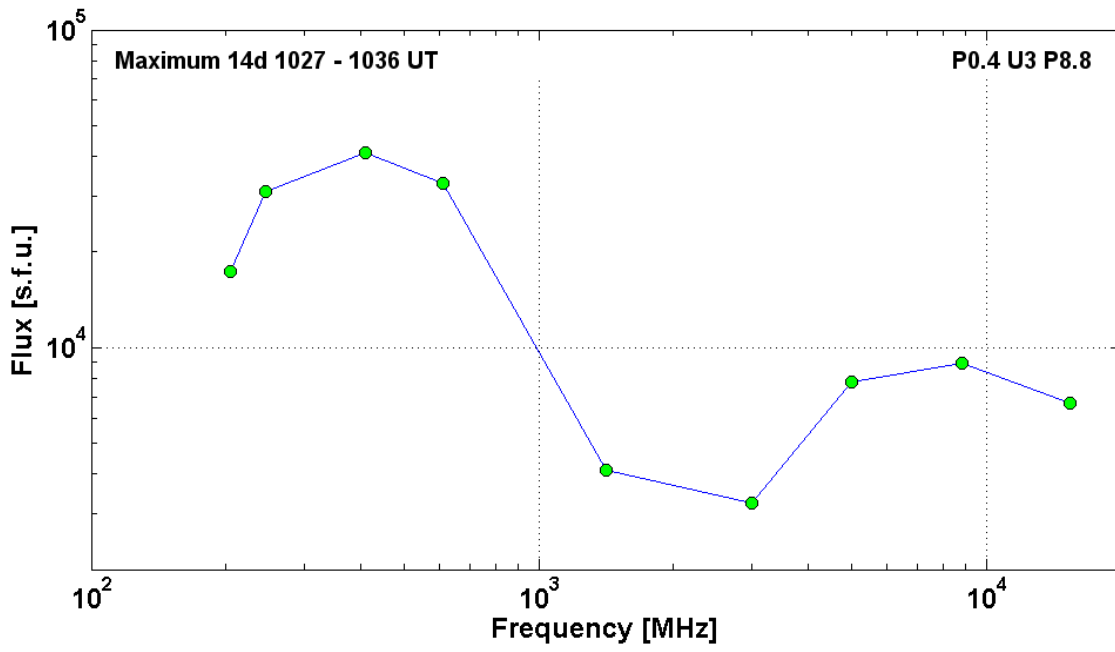
Ø solar flare 15d08^h20^m, M1.3/SF, N16W12, AR9077

Main X-ray burst 1–8 Å: onset – 14d10^h03^m, max – 14d10^h24^m, Φ = 0.75 J/m²

CME: 14d10^h54^m, V = 1674 km/s, Δφ = 360°, dA = 273°

▲SC 15^h32^m, ▲SC 15d14^h37^m

2000	July 14	●	AR9077	To event 372			
Hα	6563 Å	<1012	~1021	1330	N22W07	3B	U
1 -12.5	keV	1003	1024	1043		X5.7	7.5E-1
50 – 150	keV	101113	102011	120115		8244	Y
15.4	GHz	1012.0	1027.0	1132.0		3.83	
8.8	GHz	1007.0	1027.0	1157.0	P0.4 U3 P8.8	3.95	
5	GHz	1005.0	1027.0	1159.0		3.89	
3	GHz	1001.3	1028.6	1240.7		3.51	
1.4	GHz	1006.0	1030.0	0000.0		3.61	
610	MHz	1009.0	1032.0	1132.0		4.52	
410	MHz	1010.0	1031.0	1132.0		4.61	
245	MHz	1011.0	1036.0	1132.0		4.49	
204	MHz	1013.9	1028.2	1043.8		4.24	
DS II	H	1017		1027	220-440	2	
DS II		1020		1026	35-85	3	
DS IV		1026		1330	30-80	3	
DS III	S,C	1015		~1039	25-270	2	
DS CONT		1026		~1041	25-270	3	
DS DCIM	GG,FS	1003		1151	800-2000	3	
DS DCIM	GG	1007		1135	2000-4500	3	
CME		1054	1674 km/s	-96.1 km/s ²	360°	273°	



2000	July 15		☉	AR9087		To event 372	
H α	6563 Å	0822	0826	1146	N16W12	SF	U
1 -12.5	keV	0820	0833	0848		M1.3	1.8E-02
3	GHz	0831.6	0832.2	0836.7		1.18	
DS III	G	0832		0833	25-160	2	
DS III	g	0839		0839	30-210	2	
DS III	GG FS	0843		0845	25-160	2	
DS III	GG	0903		0904	200-270	1	

PART 2. Event 2000.07.16– (2000-198)

Particle event: To(Ep>10 MeV) – 16d11^h

Tmax₁(Ep>10 MeV) – 16d12^h, Jmax₁(Ep>10 MeV) – 100 /cm².s.sr

Tmax₂(Ep>10 MeV) – 17d02^h, Jmax₂(Ep>10 MeV) – 37 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – E max₁ = 400 MeV

– E max₂ = 320 MeV

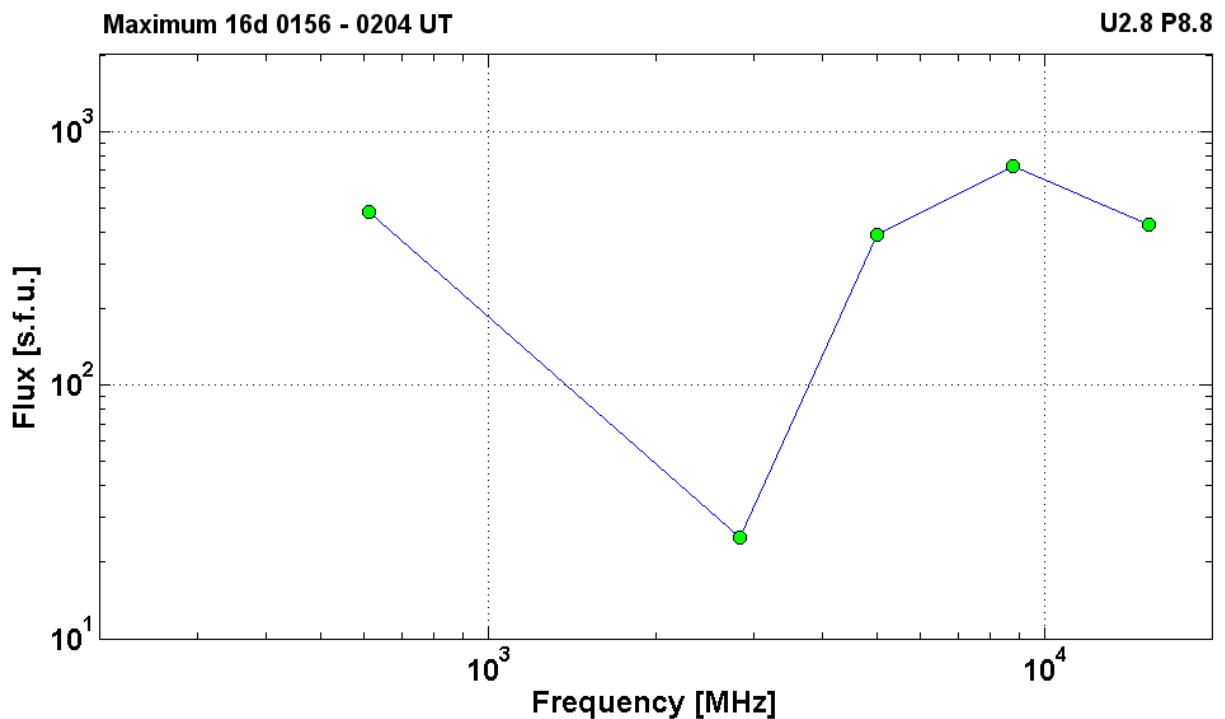
Sources: ☉ solar flare 16d01^h59^m, M5.5/1N, N09E81 AR9090

☽ solar flare 16d23^h37^m, M1.4/2F, N17W40 AR9077

Main X-ray burst 1–8 Å: onset – 16d01^h59^m, max – 16d02^h03^m, Φ = 0.016 J/m²

▲ SC 19d15^h27^m

2000 July 15		☉ AR9090			To event 373		
Hα		0159	0203	0214	N09E81	1N	U
1 -12.5	keV	0159	0203	0214		M5.5	1.6E-02
15.4	GHz	0202.0	0202.0	0204.0		2.63	
8.8	GHz	0202.0	0202.0	0204.0	U2.8 P8.8	2.86	
5	GHz	0202.0	0202.0	0205.0		2.59	
2.8	GHz	0200.0	0204.0	0210.0		1.40	
610	MHz	0147.0	0156.0	0000.0		2.68	
DS III	B	0203		0203	35-90	1	
DS III	G	0225		0227	30-75	1	



2000	July 16	Ø			AR9077	To event 373	
H α		2341	2352	0051	N17W40	2F	EFU
1 -12.5	keV	2337	0004	0015		M1.4	1.7E-02
2.8	GHz	2333.0	2342.0	0143.0		1.40	
610	MHz	2354.0	2355.0	2356.0		1.91	
DS III	N	2310		2339	28-180	1	
DS III	N	2317		2324	57-180	1	

PART 2. Event 2000.07.22 – (2000-204)

Particle event: To(Ep>10 MeV) – 22d12^h

Tmax₁(Ep>10 MeV) – 22d14^h, Jmax₁ (Ep>10 MeV) – 13 /cm².s.sr

Tmax₂(Ep>10 MeV) – 22d20^h, Jmax₂ (Ep>10 MeV) – 6 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – E max₁ = 340 MeV

– E max₂ = 90 MeV

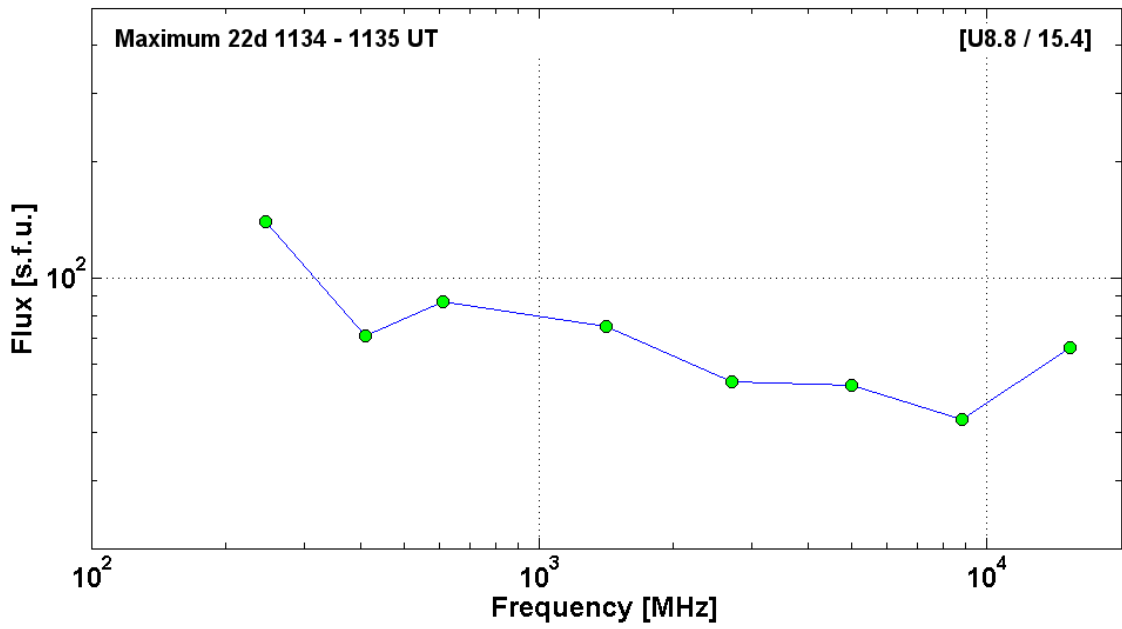
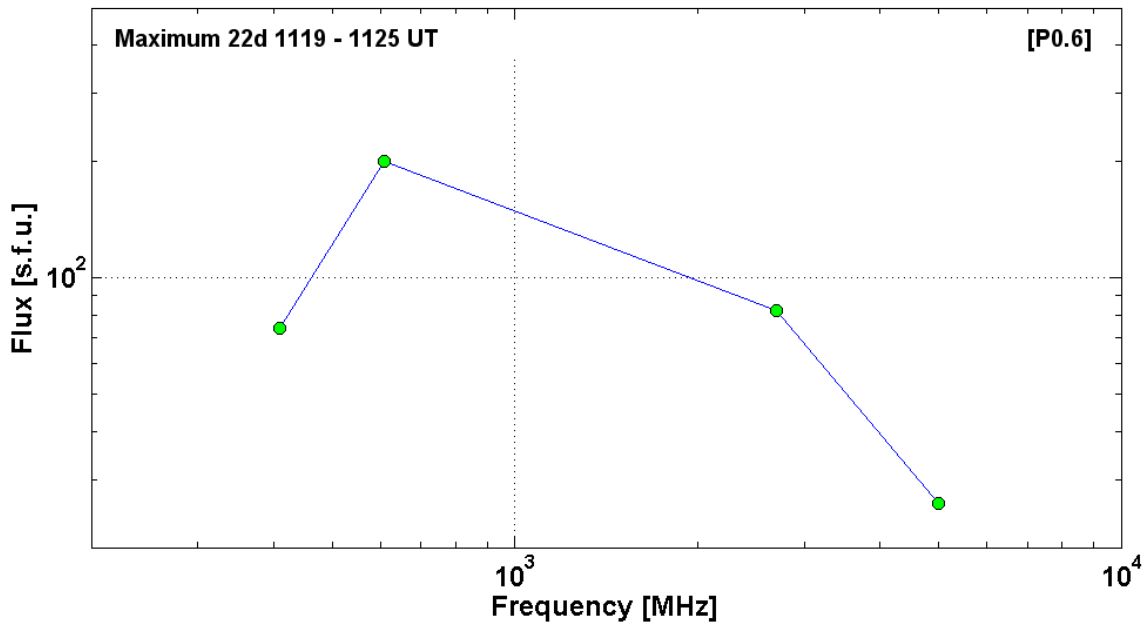
Sources: ● solar flare 22d11^h17^m, M3.7/2N, N14W56, AR9085

Main X-ray burst 1–8 Å : onset – 22d11^h17^m, max – 22d11^h34^m, Φ = 0.07 J/m²

CME: 22d11^h54^m, V = 1230 km/s , Δφ = 229°, dA = 275°;

▲ SC 23d10^h41^m

2000	July 22	●	AR9085	To event 374			
Hα	6563 Å	1117	1125	1246	N14W56	2N	FU
1 -12.5	keV	1117	1134	1202		M3.7	7.0E-2
53-93		<112059	~112335	>112339		253	Y
5	GHz	1125.0	1125.0	~1125.0		1.41	
2.7	GHz	1119.0	1124.0	1133.0		1.91	
610	MHz	1118.0	1119.0	1142.0	[P0.6]	2.30	
410	MHz	1119.0	1120.0	1122.0		1.87	
8.8	GHz	1124.0	1134.0	1142.0		1.63	
5	GHz	1122.0	1134.0	1142.0		1.72	
1.4	GHz	1119.0	1134.0	1141.0		1.88	
DS II	FS	1125		1144	25-160	2	
DS DCIM	GG	1117		1204	800-2000	2	
DS DCIM	GG	1118		1153	2000-4500	1	
15.4	GHz	1133.0	1135.0	1158.0	[U8.8 / 15.4]	1.82	
8.8	GHz	1133.0	1146.0	1158.0		1.91	
5	GHz	1133.0	1146.0	1158.0		1.81	
2.7	GHz	1133.0	1134.0	1158.0		1.73	
610	MHz	1133.0	1134.0	1158.0		1.94	
410	MHz	1133.0	1134.0	1158.0		1.85	
245	MHz	1133.0	1134.0	1158.0		2.15	
DS IV		1137		1751	35-85	1	
DS III	G	1136		1136	200-260	2	
DS CONT		~1133		~1138	135-270	2	
CME		1154	1230 km/s	-12.4 km/s ²	229°	275°	



PART 2. Event 2000.07.28 – (2000-210)

Particle event: To(Ep>10 MeV) – 28d02^h

Tmax₁(Ep>10 MeV) – 28d06^h, Jmax₁(Ep>10 MeV) – 5 /cm².s.sr

Tmax₂(Ep>10 MeV) – 28d12^h, Jmax₂(Ep>10 MeV) – 13 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – E max₁ = 145 MeV

– E max₂ = 110 MeV

Sources: ☉ solar flare 27d23^h37^m, M1.2/SF, N11W78, AR9090

Main X-ray burst 1-8 Å: onset – 27d23^h37^m, max – 27d23^h 42^m, Φ = 0.0044 J/m²

CME: 28d00^h54^m, V = 0447 km/s, Δφ = 057°; dA = 296°

▲ SC 28d06^h34^m

2000 July 27 ☉ AR9090 To event 375

Hα	6563 Å	<2340	~2341	>0046	N11W78	SF	FU
1 -12.5	keV	2337	2342	2347		M1.2	4.4E-3
53-93	keV	<233922	234114	234406		237	Y
5.7	GHz	2340.8	2342.3	2344.4		1.18	
2.8	GHz	2335.0	2341.0	2347.0		0.85	
CME		0054	0447 km/s	-1.8 km/s ²	057°	296°	

PART 2. Event 2000.08.11 – (2000-224)

Particle event: To(Ep>10 MeV) – 11d15^h

Tmax(Ep>10 MeV) – 11d17^h, Jmax (Ep>10 MeV) – 3.2 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 75 MeV

Sources: unknown back side solar flare <11d16^h54^m,

CME: 11d16^h54^m, V = 0300 km/s, Δφ = 271°, dA = 035°

▲ SC 11d18^h46^m

2000	August 11	<input type="checkbox"/>	AR	To event 376		
CME		1654	0300 km/s	035°	273°	

PART 2. Event 2000.08.13 – (2000-226)

Particle event: To(Ep>10 MeV) – 13d01^h

Tmax(Ep>10 MeV) – 13d06^h, Jmax (Ep>10 MeV) – 1.2 /cm².s.sr

Duration of the event – 1 day

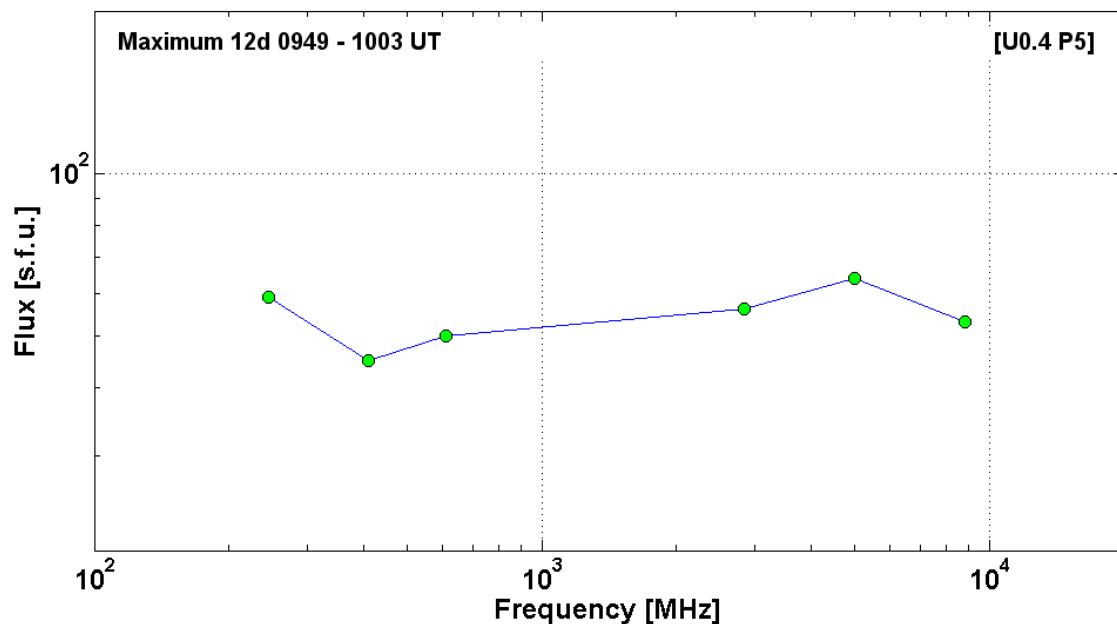
Maximum recorded proton energy of the event – Emax = 70 MeV

Sources: • solar flare 12d09^h56^m, M1.1/SN, S16W79, AR9119

Main X-ray burst 1–8 Å : onset – 12d09^h45^m, max – 12d09 56^m, Φ = 0.011 J/m²

CME: 12d10^h35^m, V = 0662 km/s, Δφ = 168°; dA = 262°

2000	August 12	•	AR9119	To event 377			
Hα	6563 Å	0951	0954	1015	S16W79	SN	AL
1 -12.5	keV	0945	0956	1009		M1.1	1.1E-2
50 -150	keV	0948	0949	0957		351	Y
8.8	GHz	0948.0	0951.0	0955.0		1.72	
5	GHz	0947.0	0949.0	0955.0	[U0.4 P5]	1.81	
2.8	GHz	0947.0	1002.7	1016.0		1.75	
610	MHz	0947.0	0951.0	0955.0		1.70	
410	MHz	0955.0	0956.0	0956.0		1.65	
245	MHz	0954.0	1003.0	1004.0		1.77	
DS III	GG	0956		0956	220-500	2	
DS DCIM	G,W	0948		0955	2000-4500	1	
DS DCIM		0949		0953	800-1672	2	
DS DCIM	G	1001		1006	2000-4500	1	
DS DCIM		1001		1006	800-2000	1	
CME		1035	0662 km/s	-6.7 km/s ²	168°	262°	



PART 2. Event 2000.09.12 – (2000-256)

Particle event: To(Ep>10 MeV) – 12d14^h

Tmax(Ep>10 MeV) – 13d02^h, Jmax (Ep>10 MeV) – 180 /cm².s.sr

Duration of the event – 6 days

Maximum recorded proton energy of the event – Emax = 350 MeV

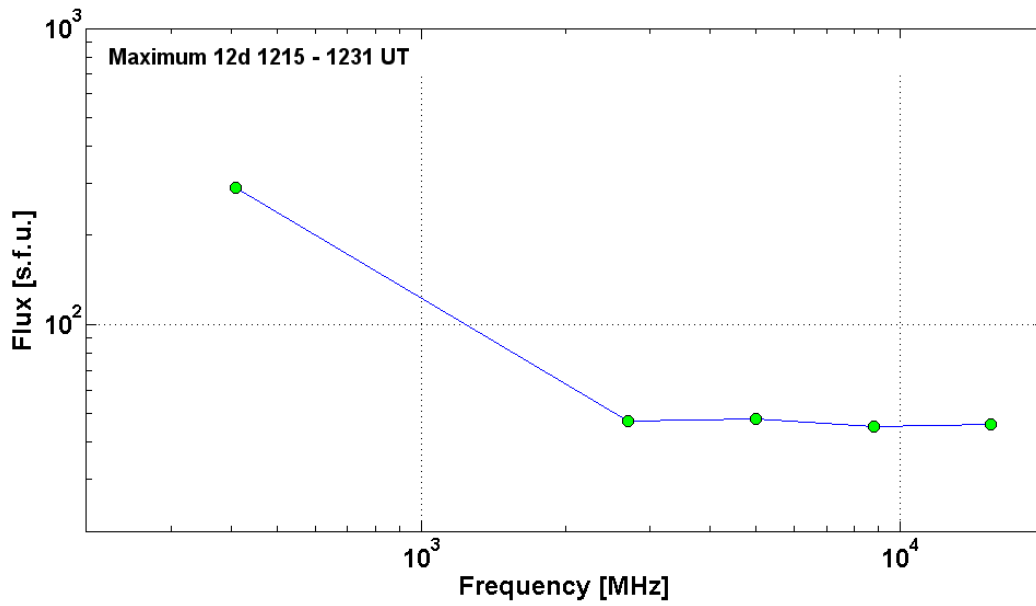
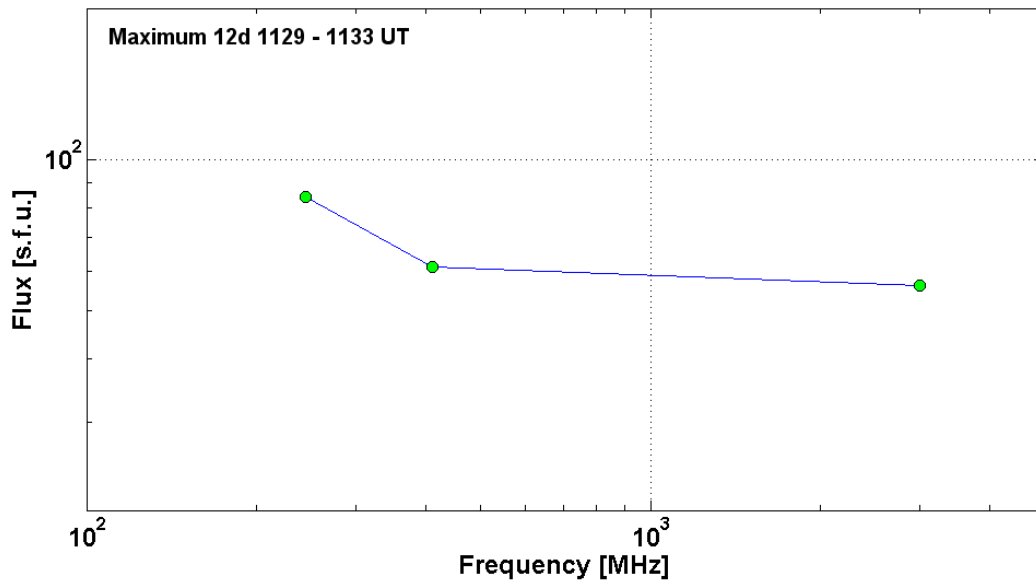
Sources: ● solar flare 12d11^h22^m, 2F/M1.0, S19W08, AR9163

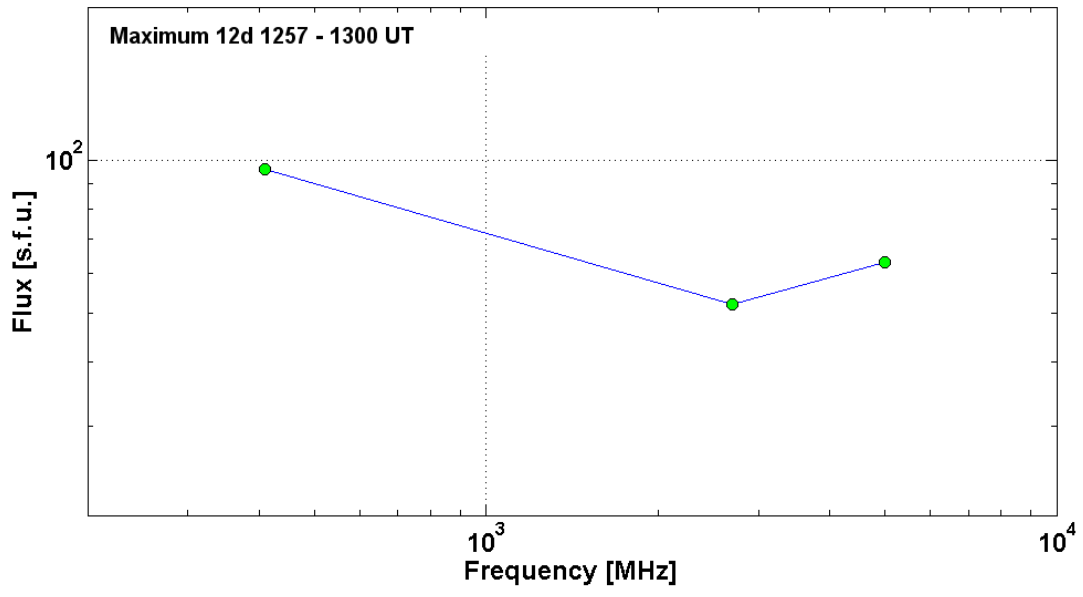
Main X-ray burst 1-8 Å: onset – 12d11^h31^m, max – 12d12^h00^m, Φ = 0.045 J/m²

CME: 12d11^h54^m, V = 1550 km/s, Δφ = 360°, dA = 220°

▲SC 15d04^h50^m, ▲SC 15d19^h12^m,

2000	September 12	●	AR9163	To event 378			
Hα	6563 Å	1122	1200	1458	S19W08	2F	U
1 -12.5	keV	1131	1213	1313		M1.0	4.5E-2
3	GHz	1122.8	1129.2	>1255.8		1.75	
410	MHz	1130.0	1133.0	1137.0		1.79	
245	MHz	1128.0	1129.0	1129.0		1.92	
DS II	HARM,FS	1133		1149	25-180	2	
DS I	N	1151		~1231	80-270	1	
DS III	S	~1137		1144	160-270	1	
DS III	GG,DS	1152		1211	25-250	2	
15.4	GHz	1152.0	1215.0	1309.0		1.66	
8.8	GHz	1154.0	1222.0	1327.0		1.65	
5	GHz	1154.0	1222.0	1341.0		1.68	
2.7	GHz	1210.0	1231.0	0000.0		1.67	
410	MHz	1215.0	1215.0	1220.0		2.46	
DS III		1216		1224	25-40	1	
5	GHz	1210.0	1257.0	1345.0		1.80	
2.7	GHz	1210.0	1257.0	0000.0		1.72	
410	MHz	1300.0	1300.0	1302.0		1.98	
DSF	6563 Å	~1050		1230	S12W18	23°	
CME		1154	1550 km/s	58.2 km/s ²	360°	220°	





PART 2. Event 2000.10.16 – (2000-290)

Particle event: To(Ep>10 MeV) – 16d08^h

Tmax₁(Ep>10 MeV) – 16d11^h, Jmax₁(Ep>10 MeV) – 3.5/cm².s.sr

Tmax₂(Ep>10 MeV) – 16d17^h, Jmax₂(Ep>10 MeV) – 9.8/cm².s.sr *)

Duration of the event – 4 days

Maximum recorded proton energy of the event – E max₁ = 310 MeV

– E max₂ = 145 MeV

*) The data from IMP-8

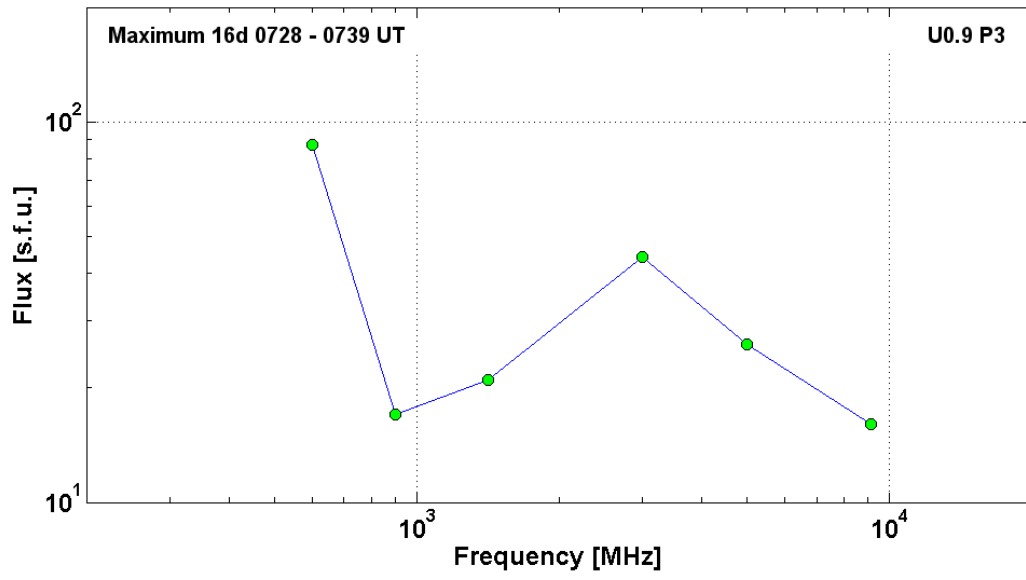
Sources: ☐ solar flare 16d06^h40^m, M2.5/ -, n05w90*, AR9182 2d behind W-limb

Main X-ray burst 1–8 Å onset – 16d06^h40^m, max – 16d07^h28^m, Φ = 0.16 J/m²

CME: 16d07^h27^m, V = 1336 km/s, Δφ = 360°, dA = 270°

* – probable localization of the flare event

2000	October 16	☐			AR9182	To event 379	
Hα		No Data			n05w90		
1 -12.5	keV	0640	0728	0911		M2.5	1.6E-1
53 – 93	keV	0640	0709	0730		8	Y
9.1	GHz	0658.5	0739.0	0839.0		1.20	
5	GHz	0728.0	0728.0	0729.0		1.41	
3	GHz	0722.9	0728.8	0732.0	U0.9 P3	1.64	
1.4	GHz	0728.0	0730.0	0732.0		1.32	
900	MHz	0718.0	0728.2	0909.0		1.23	
600	MHz	0722.5	0728.0	0744.3		1.94	
DS II	UE	0705		0718	20-60	2	
DS IV		0704		0820	25-146	1	
DS III	N	0718		~0916	45-95	1	
DS CONT		0722		0741	800-2000	1	
CME		0727	1366 km/s	9.9 km/s ²	360°	2270°	



PART 2. Event 2000.10.25 – (2000-299)

Particle event: To(Ep>10 MeV) – 25d13^h

Tmax(Ep>10 MeV) – 25d23^h, Jmax (Ep>10 MeV) – 4.1/cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 95 MeV

Sources: ☐ solar flare 25d08^h45^m, C4/..., ... w90, AR– unknown

Main X-ray burst 1–8 Å : onset – 25d08^h 45^m, max – 25d11^h25^m, Φ = 0.065 J/m²

CME: 25d08^h26^m, V= 0770 km/s, Δφ = 360°, dA = 275°

▲ SC 28d09^h54^m

2000	October 25	☐	AR			To event 380	
Hα	6563 Å	No Flare					
1 -12.5	keV	0845	1125	1521		C4.0	6.5E-2
CME		0826	0770 km/s	17.4km/s ²	360°	275°	

PART 2. Event 2000.10.31 – (2000-305)

Particle event: To(Ep>10 MeV) – 31d07^h

Tmax(Ep>10 MeV) – 01d03^h, Jmax (Ep>10 MeV) – 2.1/cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 70 MeV

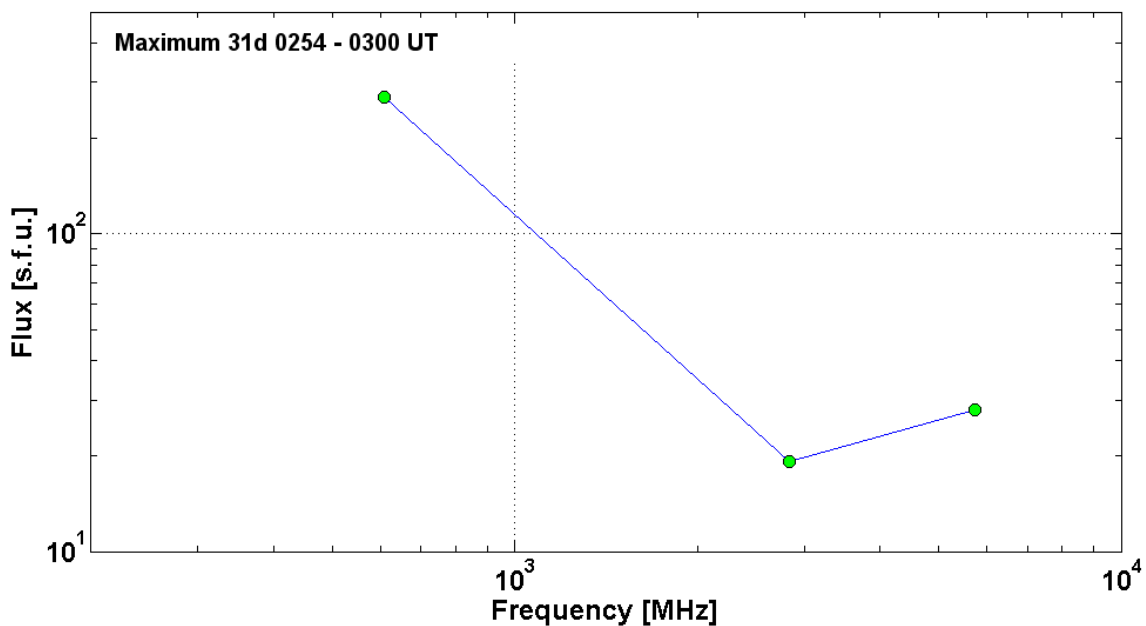
Sources: o solar flare 31d02^h51^m, C6.0/1N, S20E08, AR9209

Main X-ray burst 1–8 Å: onset – 31d02^h51^m, max – 31d03^h00^m, $\Phi = 0.0036 \text{ J/m}^2$

CME: 31d03^h50^m, V = 0074 km/s, $\Delta\phi = 189^\circ$, dA = 113°

▲ SC 31d17^h14^m

2000	October 31	o			AR9209	To event 381	
H α		0253	0300	0320	S20E08	1N	EF
1 -12.5	keV	0251	0300	0307		C6.0	3.6E-03
5.7	GHz	0252.7	0300.0	0321.5		1.45	
2.8	GHz	0251.0	0254.8	0306.0		1.28	
610	MHz	0259.0	0259.0	~0259.0		2.43	
CME		0350	0074km/s	2.5km/s ²	189°	113°	



PART 2. Event 2000.11.08 – (2000-313)

Particle event: To(Ep>10 MeV) – 08d23^h

Tmax(Ep>10 MeV) – 09d15^h, Jmax (Ep>10 MeV) – 9.7·10³/cm².s.sr

Duration of the event – 8 days

Maximum recorded proton energy of the event – Emax = 650 MeV

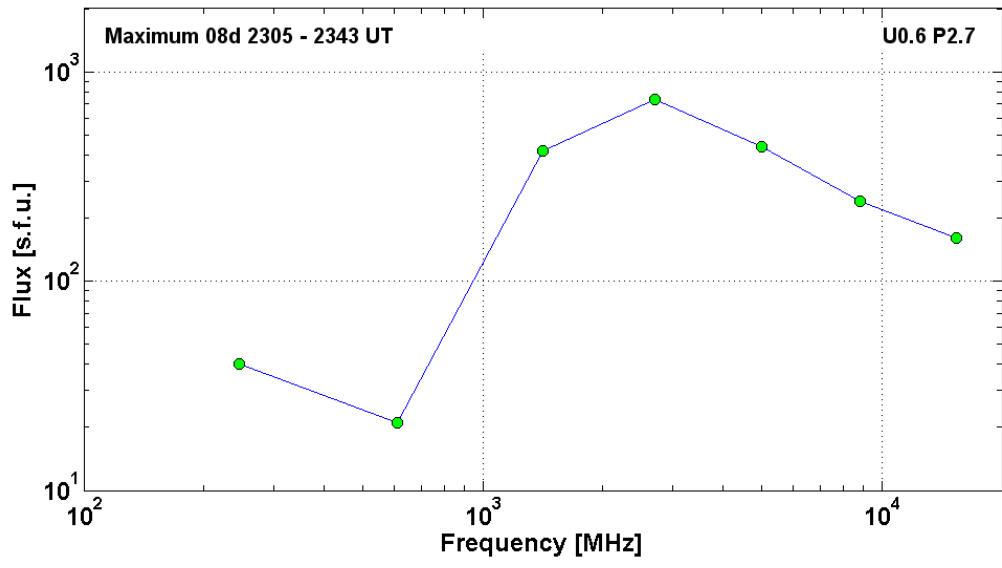
Sources: ● solar flare 08d22^h40^m, 3F/M7.4, N20W66, AR9213

Main X-ray burst 1–8 Å: onset – 08d22^h 42^m, max – 08d23^h 28^m, Φ = 0.21 J/m²

CME: 08d23^h06^m, V = 1738 km/s, Δφ = 170°, dA = 299°

▲ SC 10d06^h28^m

2000	November 08	●	AR9213	To event 382			
Hα	6563 Å	2240	2323	0030	N20W66	3F	F
1 -12.5	keV	2242	2328	0005		M7.4	2.1E-1
50 – 150	keV	<2316	~2316	2355		236	Y
15.4	GHz	2306.0	2343.0	0012.0		2.20	
8.8	GHz	2305.0	2318.0	0041.0		2.38	
5	GHz	2300.0	2318.0	0041.0		2.64	
2.7	GHz	2258.0	2318.0	0052.0	U0.6 P2.7	2.87	
1.4	GHz	2258.0	2318.0	0027.0		2.62	
610	MHz	2326.0	2326.0	~2326.0		1.32	
245	MHz	2304.0	2305.0	2305.0		1.60	
DS IV		2251		2330	25-180	1	
DS IV		2306		2345	500-2000	1	
DS III	G	2249		2324	25-400	2	
DS III	N	2330		0002	25-106	1	
DS UNCLF		2316		2322	100-200	2	
CME		2306	1738 km/s	69.9km/s ²	170°	299°	



PART 2. Event 2000.11.24 – (2000-329)

Particle event: To(Ep>10 MeV) – 24d07^h

Tmax(Ep>10 MeV) – 24d21^h, Jmax (Ep>10 MeV) – 65/cm².s.sr

Duration of the event – 1.5 days

Maximum recorded proton energy of the event – Emax = 460 MeV

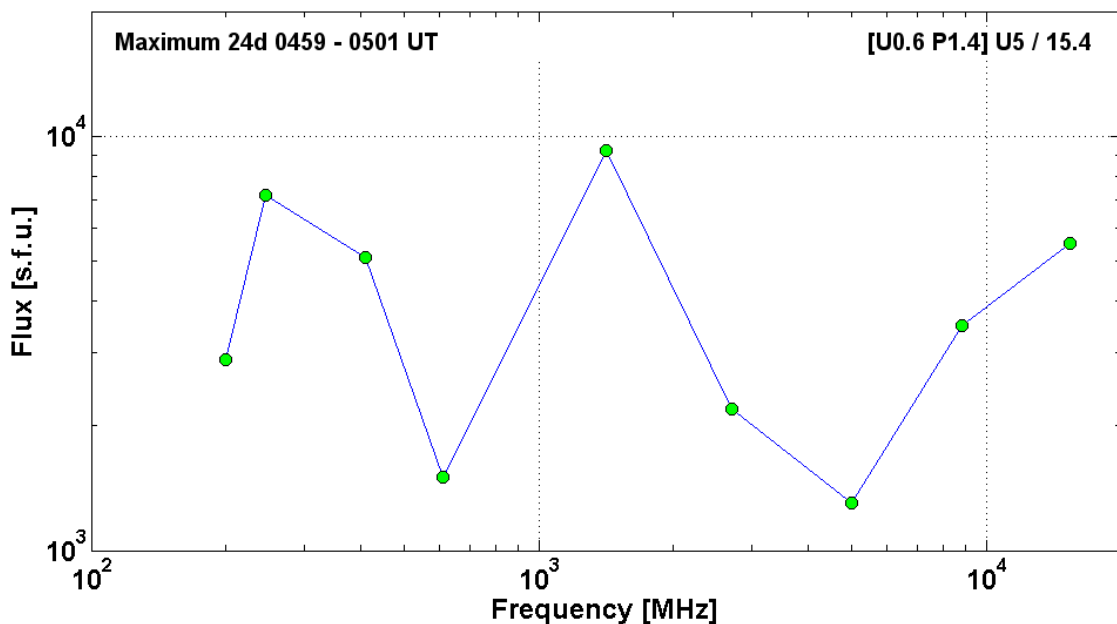
Sources: ● solar flare 24d04^h55^m, X2.0/3B, N20W05, AR9236

○ solar flare 24d14^h51^m, X2.3/2B, N20W08, AR9236

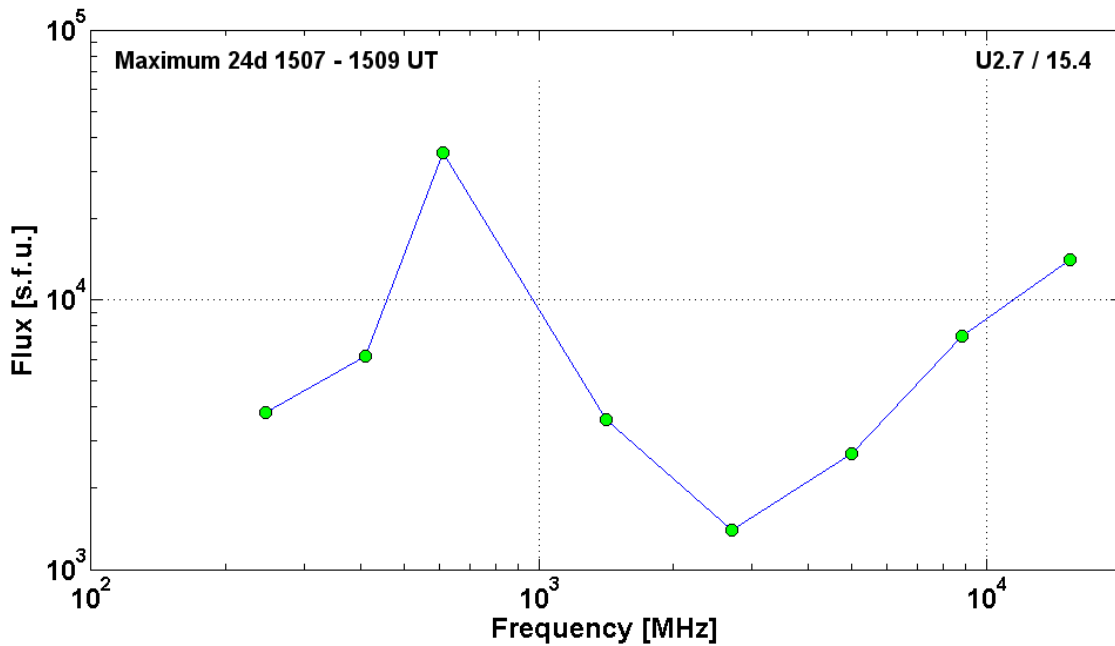
Main X-ray burst 1–8 Å: onset –24d04^h55^m, max – 24d05^h02^m, Φ = 0.083 J/m²

CME: 24d05^h30^m, V = 1298 km/s, Δφ = 360°, dA = 313°

2000	November 24	●	AR9236			To event 383	
Hα	6563 Å	0457	0501	0535	N20W05	3B	EF
1 -12.5	keV	0455	0502	0508		X2.0	8.3E-2
15.4	GHz	0458.0	0500.0	0516.0	U5 / 15.4	3.74	
8.8	GHz	0458.0	0500.0	0520.0		3.54	
5	GHz	0458.0	0501.0	0512.0		3.11	
2.7	GHz	0458.0	0459.0	0507.0		3.34	
1.4	GHz	0458.0	0459.0	0507.0	[U0.6 P1.4]	3.96	
610	MHz	0458.0	0501.0	0510.0		3.18	
410	MHz	0458.0	0459.0	0506.0		3.71	
245	MHz	0458.0	0501.0	0506.0		3.86	
200	MHz	0459.0	0459.0	0514.0		3.46	
DS II		0502		0529	25-180	3	
DS III	G	0459		0502	18-900	3	
DS III	G	0510		0516	18-80	3	
CME		0530	1298 km/s	2.1km/s ²	360°	313°	



2000	November 24	Ø			AR9213	To event 383	
H α	6563 Å	1454	1510	1601	N20W08	2B	FH
1 -12.5	keV	1451	1513	1521		X2.3	1.6E-1
53 - 93	keV	1454	1511	1536		1498	Y
1.2 - 5.6	MeV	1454	1508	1536	16267	195	Y
15.4	GHz	1500.0	1508.0	1612.0	U2.7 / 15.4	4.15	
8.8	GHz	1454.0	1509.0	1612.0		3.86	
5	GHz	1453.0	1508.0	1609.0		3.43	
2.7	GHz	1455.0	1508.0	1612.0		3.15	
1.4	GHz	1454.0	1508.0	1525.0		3.56	
610	MHz	1454.0	1508.0	1612.0		4.54	
410	MHz	1453.0	1509.0	1612.0		3.79	
245	MHz	1453.0	1507.0	1612.0		3.58	
DS II		1512		1523	30-80	3	
DS III	N	1457		1523	30-80	3	
^o n							Bolivia
CME		1530	1454 km/s	-3.3km/s ²	360°	324°	



PART 2. Event 2000.11.26 – (2000-331)

Particle event: To(Ep>10 MeV) – 26d03^h

Tmax(Ep>10 MeV) – 26d20^h, Jmax (Ep>10 MeV) – 670/cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax = 405 MeV

Sources: ● solar flare 25d 00^h59^m, M8.2/2N, N07E50, AR9240

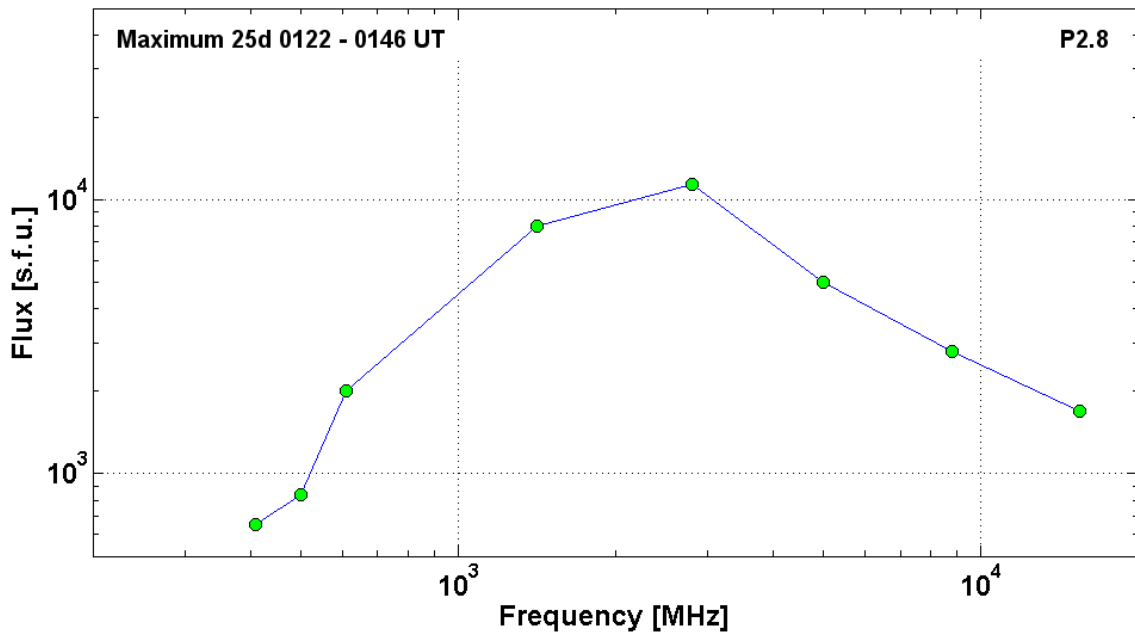
○ solar flare 25d 18^h33^m, X1.9/2B, N19W24, AR9236

Main X-ray burst 1–8 Å: onset – 25d18^h33^m, max – 25d18^h44^m, Φ = 0.21 J/m²

CME: 26d01^h31^m, V = 2519 km/s, Δφ = 360°, dA = 082°

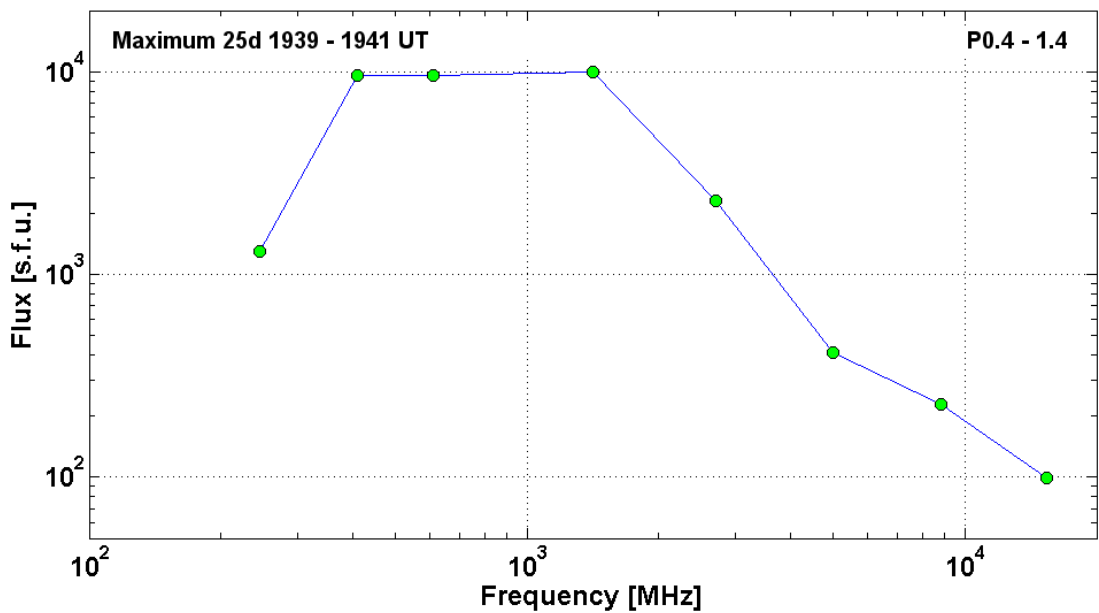
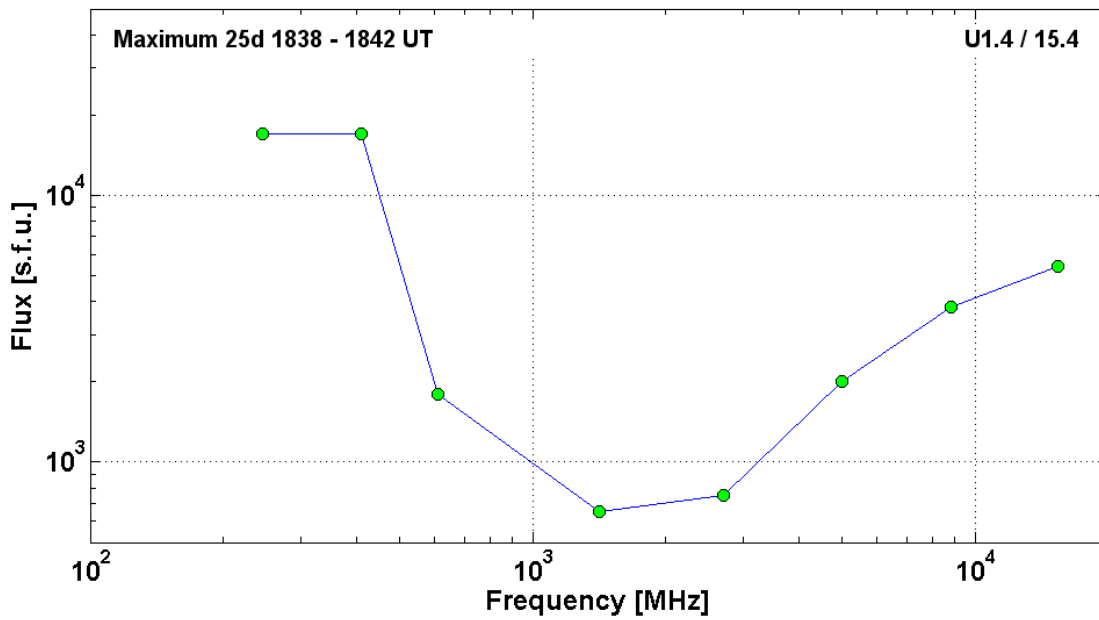
▲ SC 26d07^h58^m, ▲ SC 26d11^h58^m, ▲ SC 28d05^h31^m

2000	November 25	●	AR9240	To event 384			
Hα	6563 Å	0100	0106	0324	N07E50	2N	FU
1 -12.5	keV	0059	0131	0201		M8.2	2.1E-1
53 – 93	keV	0056	0122	0133		81	Y
1.2 – 5.6	MeV	005535	012226	013239		1911	Y
410	MHz	0113.0	0113.0	0125.0		2.73	
245	MHz	0107.0	0108.0	0225.0		2.94	
200	MHz	0108.0	0114.0	0130.0		2.56	
DS II		0107		0137	25-146	3	
DS IV		0107		1031	25-180	2	
DS IV		0118		0259	400-2000	2	
DS III	N	0104		0215	25-180	3	
15.4	GHz	0104.0	0122.0	0201.0		3.23	
8.8	GHz	0100.0	0122.0	0235.0		3.45	
5	GHz	0058.0	0122.0	0249.0		3.70	
2.8	GHz	0057.0	0131.0	0247.0	P2.8	4.05	
1.4	GHz	0055.0	0142.0	0245.0		3.90	
610	MHz	0103.0	0145.0	0239.0		3.30	
500	MHz	0059.0	0146.0	0221.0		2.92	
410	MHz	0113.0	0146.0	0223.0		2.81	
CME		0131	2519 km/s	-5.0km/s ²	360°	082°	



2000	November 25	Ø			AR9236	To event 384	
H α	6563 Å	1836	1841	2016	N19W24	2B	EFU
1 -12.5	keV	1833	1844	1855		X1.9	1.5E-1
53 - 93	keV	1836	1842	1948		170	Y
1.2 - 5.6	MeV	1836	1838	1948		137	Y
15.4	GHz	1833.0	1838.0	1841.0	U1.4 / 15.4	3.73	
8.8	GHz	1835.0	1838.0	1907.0		3.58	
5	GHz	1833.0	1842.0	1843.0		3.30	
2.7	GHz	1834.0	1838.0	1841.0		2.88	
1.4	GHz	1833.0	1838.0	1841.0		2.81	
610	MHz	1836.0	1838.0	1907.0		3.26	
410	MHz	1835.0	1838.0	1841.0		4.23	
245	MHz	1833.0	1838.0	1841.0		4.23	
DS II		1839		1849	25-180	2	
DS II		1845		1857	30-80	3	
DS III		1838		1842	25-180	2	
2.7	GHz	1836.0	1904.0	1907.0		3.04	
1.4	GHz	1902.0	1903.0	1904.0		3.11	
610	MHz	1902.0	1904.0	1904.0		2.82	
410	MHz	1902.0	1903.0	1904.0		3.46	
245	MHz	1902.0	1902.0	1905.0		3.00	

15.4	GHz	1939.0	1941.0	1943.0		2.00	
8.8	GHz	1938.0	1941.0	1947.0		2.36	
5	GHz	1938.0	1941.0	1945.0		2.61	
2.7	GHz	1937.0	1941.0	1944.0		3.36	
1.4	GHz	1927.0	1939.0	1947.0	P0.4 - 1.4	4.00	
610	MHz	1932.0	1941.0	1947.0		3.98	
410	MHz	1938.0	1941.0	1945.0		3.98	
245	MHz	1938.0	1939.0	1942.0		3.11	
DS III	S	<2000		2210	20-160	1	
CME		1932	1932 km/s	-10.8 km/s ²	360°	348°	



PART 2. Event 2001.01.28 – (2001-028)

Particle event: To(Ep>10 MeV) – 28d18^h

Tmax(Ep>10 MeV) – 29d01^h, Jmax (Ep>10 MeV) – 29 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 330 MeV

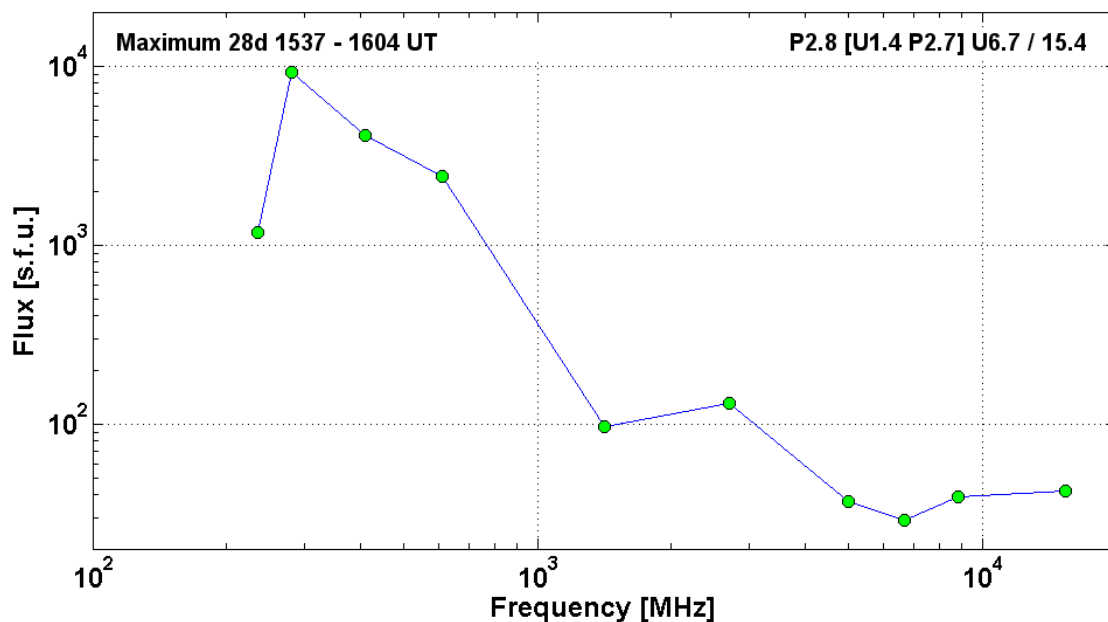
Sources: • solar flare 28d15^h08^m, 1N/ M1.5, S04W59, AR9313

Main X-ray burst 1–8 Å: 28d15^h40^m, max – 28d16^h40^m, Φ = 0.03 J/m²

CME: 28d15^h54^m, V=0916 km/s, Δφ = 360°; dA = 254°;

2001 January 28 • AR9313 To event 385

Hα	6563 Å	1508	1546	1730	S04 W59	1N	FH
1 – 12	keV	1540	1600	1624		M1.5	3.0E-2
15.4	GHz	1551.0	1604.0	1607.0	P2.8 [U1.4 P2.7]	1.62	
8.8	GHz	1548.0	1602.0	1607.0	U6.7/15.4	1.59	
6.7	GHz	1527.0	1553.0	2112.0		1.46	
5	GHz	1548.0	1552.0	1607.0		1.57	
2.7	GHz	1542.0	1552.0	1607.0		2.11	
1.4	GHz	1542.0	1553.0	1607.0		1.98	
610	MHz	1534.0	1537.0	1607.0		3.38	
410	MHz	1534.0	1539.0	1607.0		3.61	
280	MHz	1536.2	1543.2	1615.5		3.97	
235	MHz	1536.2	1541.5	1615.5		3.07	
DS DCIM	C	1522		1527	2000-4000	1	
CME		1554	0916km/s	3.5 km/s ²	360°	254°	



PART 2. Event 2001.02.26 – (2001-057)

Particle event: To(Ep>10 MeV) – 26d09^h

Tmax(Ep>10 MeV) – 26d20^h, Jmax (Ep>10 MeV) – 1 /cm².s.sr *)

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 65 MeV

*) The data from all s/c

Sources: ☐ solar flare 26d05^h14^m, C1.6/..., s04w90*, AR9354

Main X-ray burst 1–8 Å: onset – 26d05^h14^m, max – 26d07^h41^m, Φ = 0.0042 J/m²

CME: 26d05^h30^m, V=0851 km/s, Δφ = 152°, dA = 263°;

* – probable localization of the flare event

2001	February 26	☐			AR9354	To event 386	
Hα		No Flare			s04w90		
1 – 12	keV	0514	0741	0749		C1.6	4.2E-03
CME		0530	0851 km/s	8.1km/s ²	152°	263°	

PART 2. Event 2001.03.26 – (2001-085)

Particle event: To(Ep>10 MeV) – 26d20^h

Tmax(Ep>10 MeV) – 27d08^h, Jmax (Ep>10 MeV) – 1.8 /cm².s.sr

Duration of the event –1.5 days

Maximum recorded proton energy of the event – Emax = 55 MeV

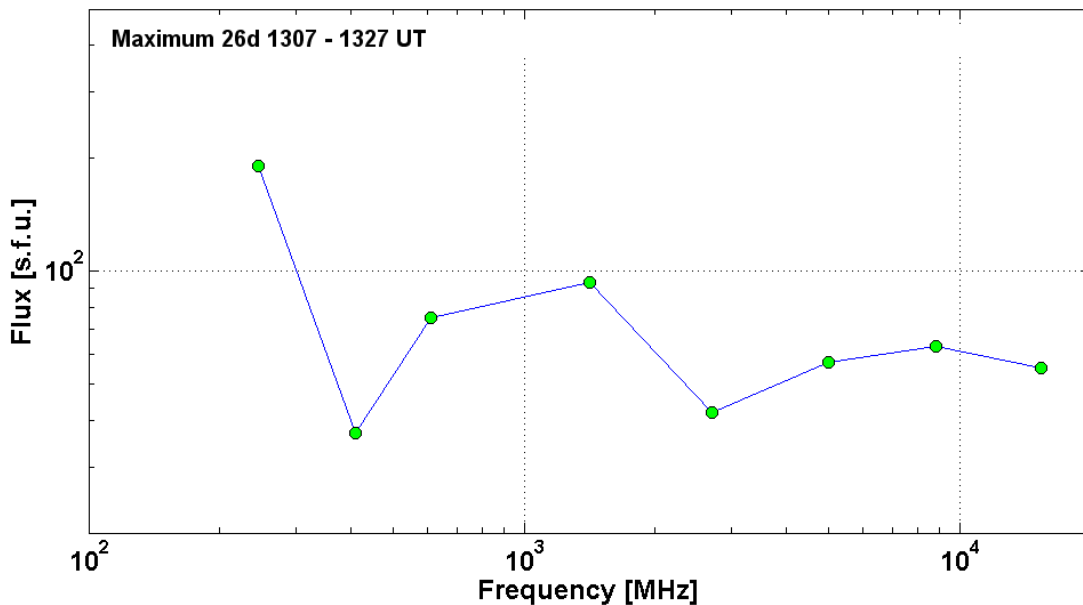
Sources: ☉ solar flare 26d13^h03^m, M2.2/1F, N15E27, AR9393

Main X-ray burst 1–8 Å: onset – 26d13^h03^m, max – 26d13^h26^m, Φ = 0.037 J/m²;

CME: 26d13^h50^m, V = 0541 km/s, Δφ = 055°, dA = 104°

▲ SC 27d17^h47^m

2001	March 26	☉	AR9393			To event 387	
Hα	6563Å	1306	1321	1423	N15E27	1F	F
1 – 12	keV	1303	1326	1344		M2.2	3.7E-2
53 – 93	keV	<131310	~131622	>132018		8	Y
15.4	GHz	1309.0	1327.0	1408.0		1.74	15.4
8.8	GHz	1309.0	1326.0	1408.0		1.80	8.8
5	GHz	1309.0	1314.0	1359.0		1.76	5
2.7	GHz	1309.0	1313.0	1351.0		1.62	2.7
1.4	GHz	1320.0	1320.0	1322.0		1.97	1.4
610	MHz	1312.0	1323.0	1328.0		1.88	610
410	MHz	1312.0	1314.0	1328.0		1.57	410
245	MHz	1307.0	1307.0	1308.0		2.28	245
DS DCIM	G	1310		1326	800-2000	2	DS DCIM
DS DCIM	C	1312		1322	1415-4000	3	DS DCIM
CME		1350	0541km/s	4.8 km/s ²	055°		



PART 2. Event 2001.03.29 – (2001- 088)

Particle event: To(Ep>10 MeV) – 29d13^h

Tmax₁(Ep>10 MeV) – 29d19^h, Jmax₁(Ep>10 MeV) – 7 /cm².s.sr

Tmax₂(Ep>10 MeV) – 31d00^h, Jmax₂(Ep>10 MeV) – 22 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – E max₁ = 220 MeV

– E max₂ = 120 MeV

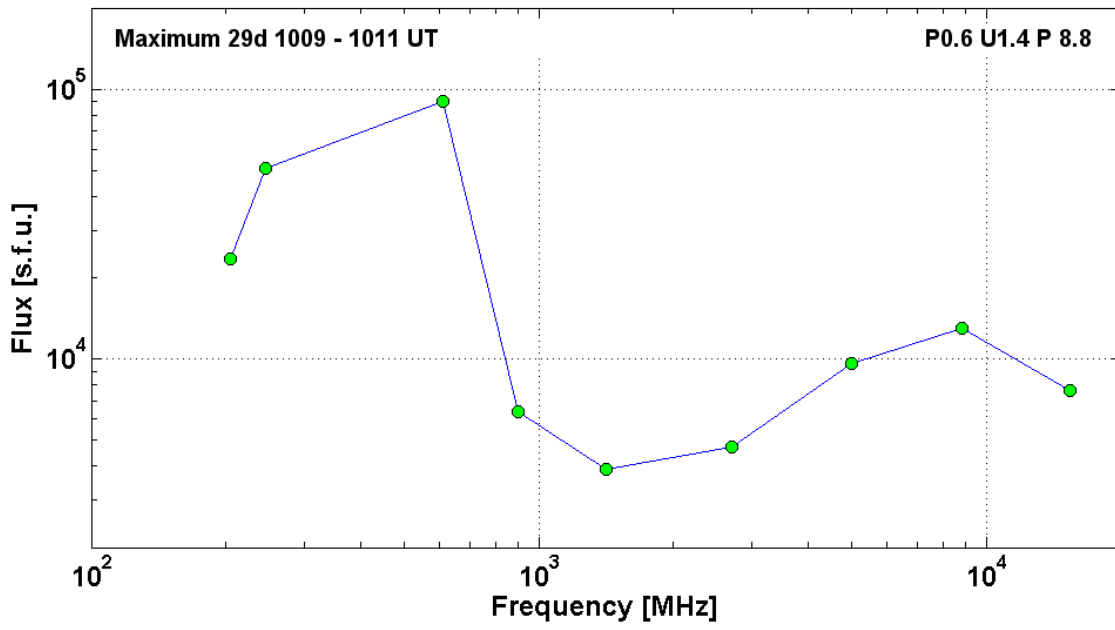
Sources: ● solar flare 29d09^h 55^m, 2N/X1.7, N16W12, AR9393

Main X-ray burst 1-8 Å: onset – 29d09^h57^m, max – 29d10^h 15^m, Φ = 0.22 J/m²

CME: 29d10^h26^m, V = 0942 km/s, Δφ = 360°, dA= 071°

▲ SC 31d00^h52^m

2001	March 29	●	AR9393			To event 388	
Hα	6563 Å	0955	1005	1108	N16 W12	2N	EFZ
1 – 12	keV	0957	1015	1032		X1.7	2.2E-1
15.4	GHz	0959.0	1010.0	1019.0		3.88	
8.8	GHz	0958.0	1011.0	1019.0	P0.6 U1.4 P 8.8	4.11	
5	GHz	0958.0	1011.0	1020.0		3.98	
2.7	GHz	0958.0	1011.0	1019.0		3.67	
1.4	GHz	1004.0	~1009.0	1029.0		3.59	
900	MHz	0957.0	1010.4	1021.0		3.81	
610	MHz	1004.0	~1011.0	1033.0		4.95	
245	MHz	1000.0	1011.0	1020.0		4.71	
204	MHz	1003.0	1010.8	1013.6		4.37	
DS II	HARM	1003		~1007	65-250	2	
DS II	UE	~1004		~1010	200-350	3	
DS IV		0958		~1038	40-800	3	
DS I	GG,DC	1000		1001	125-210	2	
DS III	G	1006		1012	1415-2080	2	
DS III	GG,C	1008		1012	120-270	2	
DS III	GG,RS	1012		1014	25-45	2	
DS III	G,C	1025		1025	25-85	2	
DS CONT		~1005		>1158	45-270	2	
DS DCIM	GG,FS	0956		1034	2000-4500	3	
DS DCIM	GG,FS	0956		1023	800-2000	3	
n°							Swiss(A,T)
CME		1026	0942 km/s	3.5 km/s ²	360°	071°	



PART 2. Event 2001.04.02 – (2001-092)

Particle event: To(Ep>10 MeV) – 02d23^h

Tmax(Ep>10 MeV) – 03d07^h, Jmax (Ep>10 MeV) – 112 /cm².s.sr

Duration of the event – 5 days

Maximum recorded proton energy of the event – Emax = 580 MeV

Sources: ■ solar flare 02d21^h32^m, X>17.5/ , n19w90*, AR9393

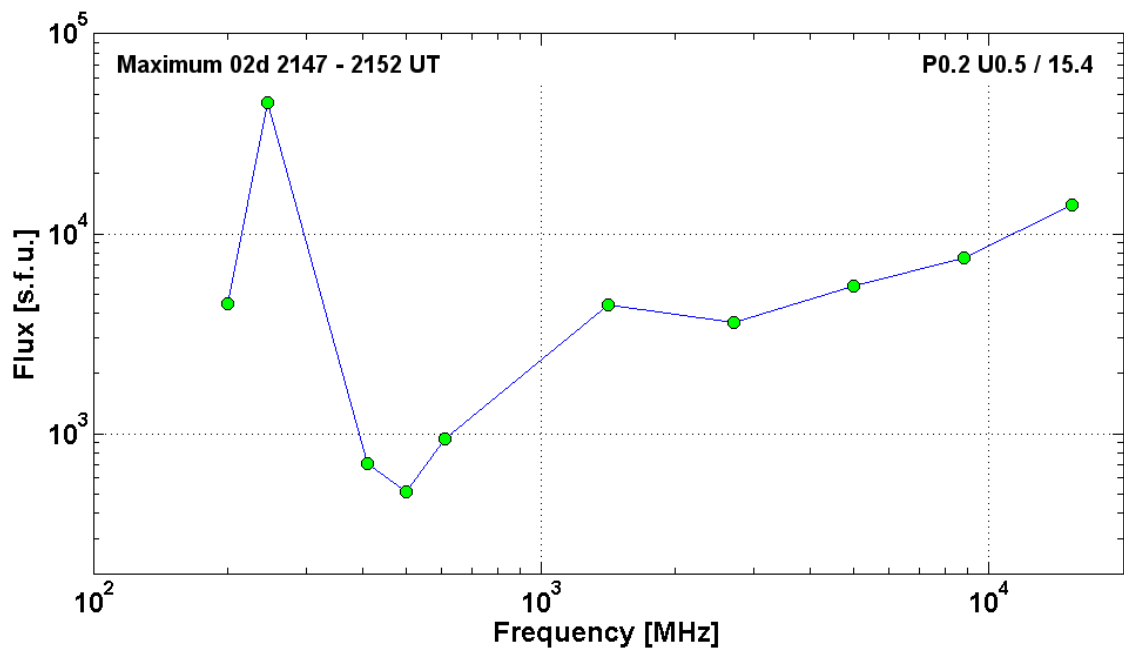
Main X-ray burst 1–8 Å: onset – 02^d 21^h 32^m, max – 02d21^h 51^m, Φ = 1.5 J/m²

CME: 02d22^h 06^m, V= 2505 km/s, Δφ = 244°, dA = 293°

▲ SC 04d14^h55^m

* – probable localization of the flare event

2001	April 02	■			AR9393	To event 389	
Hα	6563 Å	No Flare Patrol			n19w90		
1 – 12	keV	2132	2151	2203		X>17.5	1.5E00
53 – 93	keV	212902	213634	>213750		55	Y
53 – 93	keV	<221334	~221334	>005640		11	Y
15.4	GHz	2132.0	2149.0	2316.0	P0.2 U0.5/15.4	4.15	15.4
8.8	GHz	2135.0	2147.0	2321.0		3.88	8.8
5	GHz	2135.0	2147.0	2210.0		3.74	5
2.7	GHz	2143.0	2148.0	2212.0		3.56	2.7
1.4	GHz	2144.0	2148.0	2323.0		3.64	1.4
610	MHz	2146.0	2150.0	2205.0		2.97	610
500	MHz	2146.0	2150.0	2203.0		2.71	500
410	MHz	2148.0	2149.0	2201.0		2.85	410
245	MHz	2146.0	2152.0	2214.0		4.65	245
200	MHz	2149.0	2152.0	2207.0		3.65	200
DS II		2152		2157	25-280	3	DS II
DS III	N	2135		0156	25-180	1	DS III
DS III	B	2149		2150	70-120	2	DS III
n°							Armenia(S)
CME		2206	2505 km/s	108.5 km/s ²	244°	293°	



PART 2. Event 2001.04.09 – (2001-099)

Particle event: To(Ep>10 MeV) – 09d17^h

Tmax(Ep>10 MeV) – 09d20^h, Jmax (Ep>10 MeV) – 2.2 /cm².s.sr

Duration of the event – 0.6 days

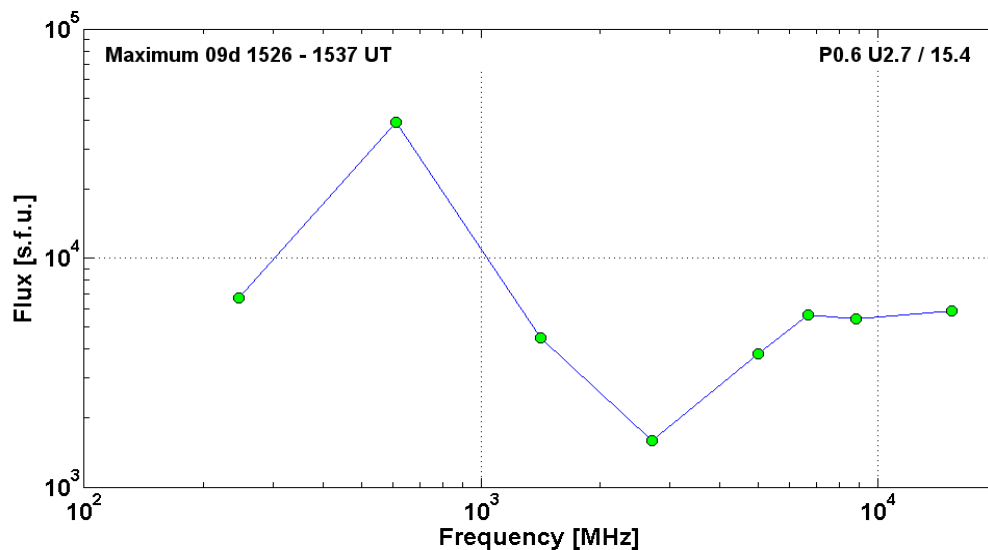
Maximum recorded proton energy of the event – Emax = 390 MeV

Sources: • solar flare 09d15^h20^m, M7.9/1B, S21W04, AR9415

Main X-ray burst 1–8 Å: onset – 09d15^h20^m, max – 09d15^h34^m, Φ = 0.13 J/m²

CME: 09d15^h54^m, V=1192 km/s, Δφ = 360°, dA= 211°

2001	April 09	•	AR9415	To event 390			
Hα	6563Å	1524	1534	1712	S21W04	1B	EFH
1 – 12	keV	1520	1534	1600		M7.9	1.3E-1
53 – 93	keV	152259	~152459	>152513		25	Y
15.4	GHz	1522.0	1526.0	1614.0	P0.6 U2.7/15.4	3.77	
8.8	GHz	1522.0	1530.0	1609.0		3.73	
6.7	GHz	1522.8	1536.2	1603.8		3.75	
5	GHz	1522.0	1535.0	1614.0		3.58	
2.7	GHz	1523.0	1537.0	1614.0		3.20	
1.4	GHz	1524.0	1526.0	1614.0		3.65	
610	MHz	1524.0	1530.0	1614.0		4.59	
245	MHz	1524.0	1529.0	1614.0		3.83	
DS II		1528		1549	25-180	3	
DS IV	P	1523		~1606	40-800	3	
DS III	N	1527		1550	25-180	2	
DS DCIM	GG	1522		1605	2000-4500	3	
DS DCIM	GG,SP,FS	1524		1609	800-2000	3	
CME		1554	1192km/s	108.5km/s ²	360°	211°	



PART 2. Event 2001.04.10 – (2001-100)

Particle event: To(Ep>10 MeV) – 10d08^h

Tmax₁(Ep>10 MeV) – 11d01^h, Jmax₁(Ep>10 MeV) – 50 /cm².s.sr

Tmax₂(Ep>10 MeV) – 11d20^h, Jmax₂(Ep>10 MeV) – 280 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 350 MeV

– Emax₂ = 260 MeV

Sources: • solar flare 10d04^h59^m, 3N/X2.3, S23W09, AR9415

∅ solar flare 11d12^h56^m, M2.3/1F, S20W28 AR9415

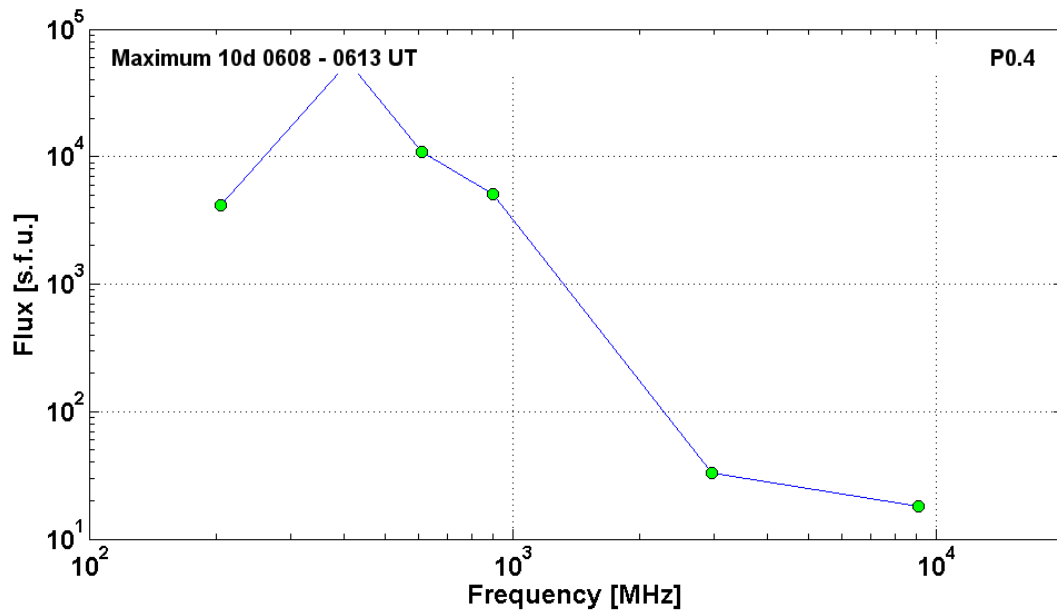
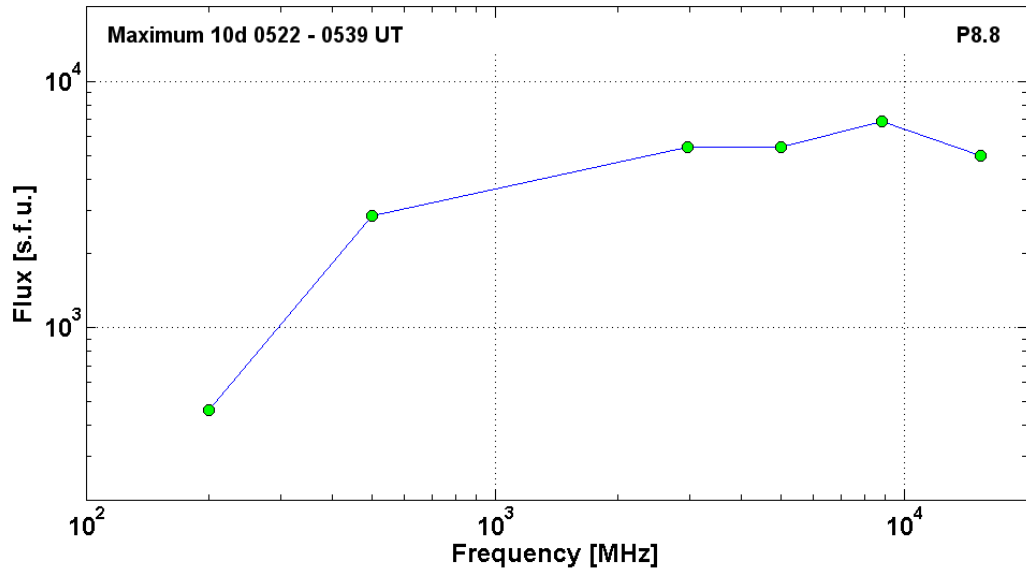
Main X-ray burst 1–8 Å: onset – 10d05^h06^m, max – 10d05^h26^m, Φ = 0.3 J/m²

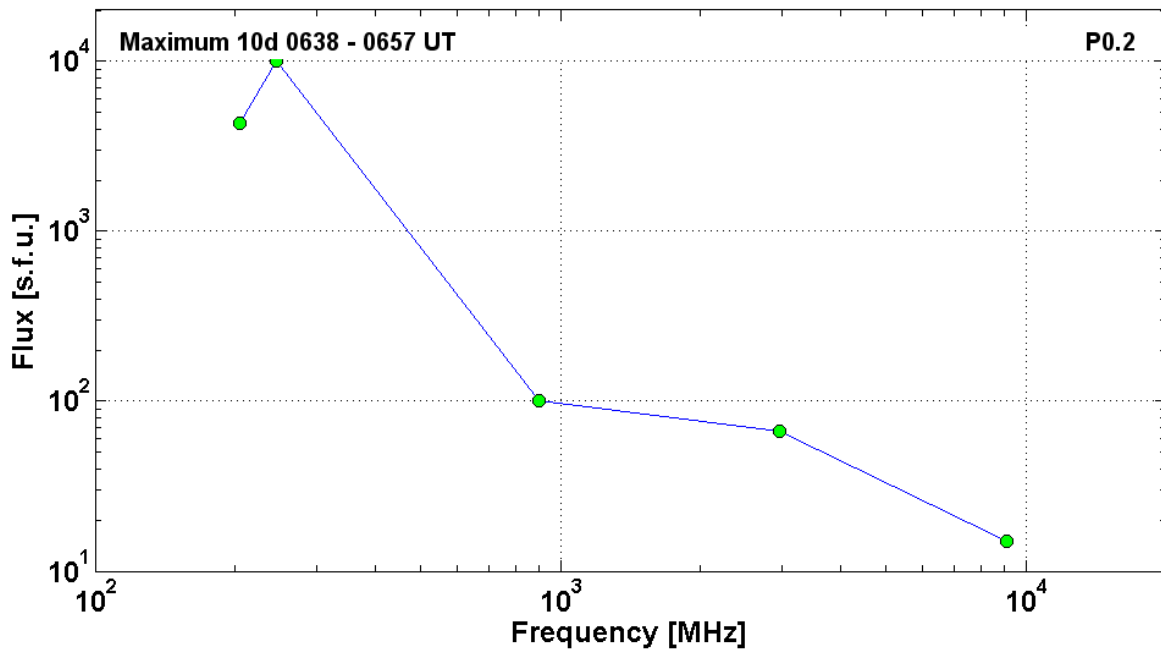
CME 10d05^h30^m, V=2411 km/s, Δφ =360°, dA= 166°

Δ SC 11d13^h43^m, Δ SC 11d15^h19^m

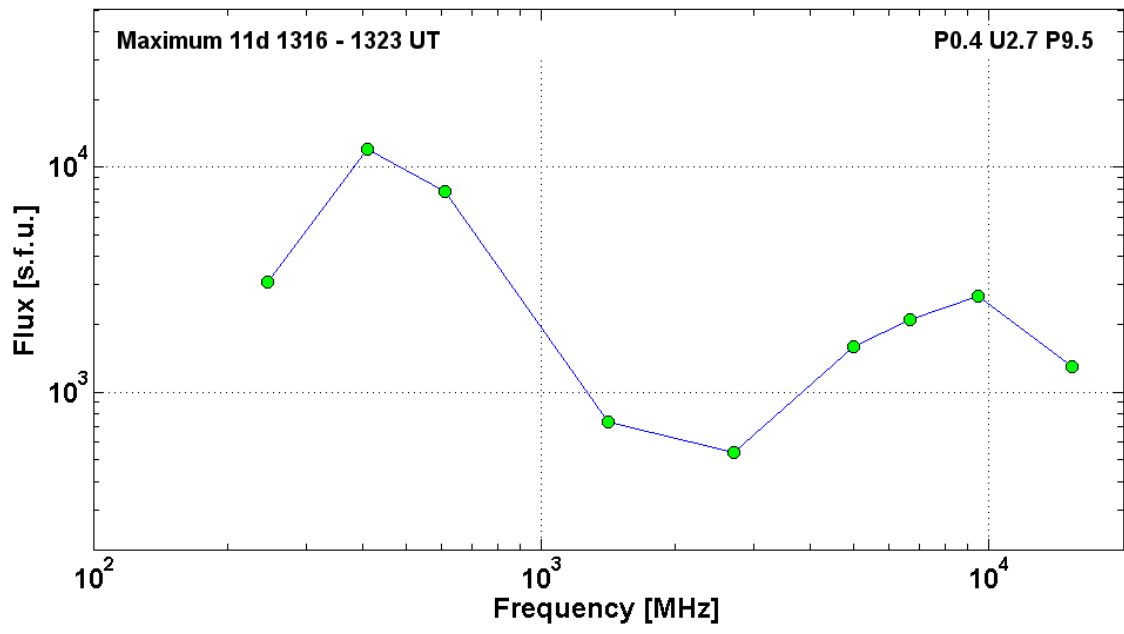
2001	April 10	•	AR9415	To event 391			
Hα	6563Å	0459	0520	0810	S23W09	3N	UZ
1 – 12	keV	0506	0526	0542		X2.3	3.0E-1
53 – 93	keV	<051343	~051907	055729		89	Y
15.4	GHz	0510.0	0523.0	0651.0		3.70	
8.8	GHz	0509.0	0522.0	0707.0	P8.8	3.84	
5	GHz	0509.0	0523.0	0706.0		3.73	
3	GHz	0504.4	0525.8	0541.1		3.73	
500	MHz	0504.0	0539.0	0700.0		3.45	
200	MHz	0504.0	0526.0			2.66	
DS II		0518		0536	25-180	3	
DS IV		0515		0535	25-600	3	
DS IV		<0518		~1010	40-800	3	
DS III	N	0509		0535	25-180	3	
DS CONT		0515		0534	23-130	3	
9.1	GHz	0607.2	0608.5	0612.5		1.26	
3	GHz	0606.4	0608.8	0622.8		1.52	
900	MHz	<0504.2	0613.0	>0617.9		3.71	
610	MHz	0524.0	0612.0	0706.0		4.04	
410	MHz	0524.0	0612.0	0743.0	P0.4	4.74	
204	MHz	0606.0	0612.3	0614.2		3.62	
DS I	S,C	<0559		>1200	45-270	2	
DS III	S	<0559		0659	45-270	2	
DS III		0656		0658	25-180	3	
DS CONT		0605		0724	220-270	2	
DS DCIM	GG,SP	0556		0619	800-2000	3	
9.1	GHz	0656.9	0657.4	0657.9		1.18	
3	GHz	0634.5	0638.3	0642.0		1.83	

900	MHz	0645.1	0648.8			2.00	
245	MHz	0451.0	0648.0	0743.0	P0.2	4.00	
204	MHz	0629.4	0657.9	0707.1		3.63	
DS III		0656		0658	25-180	3	
DS DCIM	GG,SP	0623		0706	800-2000	1	
n°							Arm, Tib, Nor
CME		0530	2411km/s	211.6*km/s ²	360°	166°	





2001	April 11	Ø	AR9415		To event 391		
H α	6563Å	1309	1321	1424	S20W28	1F	FU
1 – 12	keV	1256	1326	1349		M2.3	4.8E-2
53 – 93	keV	<132529	~132531	134203		9	Y
15.4	GHz	1303.0	1317.0	1354.0		3.11	
9.5	GHz	1257.0	1317.4	1324.0	P0.4 U2.7 P9.5	3.43	
6.7	GHz	1310.0	1318.0	1330.8		3.32	
5	GHz	1259.0	1317.0	1340.0		3.20	
2.7	GHz	1300.0	1317.0	1404.0		2.73	
1.4	GHz	1300.0	1316.0	1402.0		2.87	
610	MHz	1305.0	1323.0	1354.0		3.89	
410	MHz	1259.0	1318.0	1411.0		4.08	
245	MHz	1300.0	1318.0	1354.0		3.49	
DS II	UE	1303		1304	40-70	3	
DS IV	P	1304		~1420	40-800	3	
DS III	N	1300		1321	25-180	3	
DS III	GG	1303		1316	1415-3150	3	
DS DCIM	GG	1343		1401	2000-3768	1	
CME		1332	1103km/s	-13.0 km/s ²	360°	224°	



PART 2. Event 2001.04.12– (2001-102)

Particle event: To(Ep>10 MeV) – 12d12^h

Tmax₁(Ep>10 MeV) – 12d17^h, Jmax₁ (Ep>10 MeV) – 4.3 /cm².s.sr

Tmax₂(Ep>10 MeV) – 13d10^h, Jmax₂ (Ep>10 MeV) – 8.7 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 410 MeV

– Emax₂ = 280 MeV

Sources: ● solar flare 12d09^h39^m, X2.0/2B, S23W42 AR9415

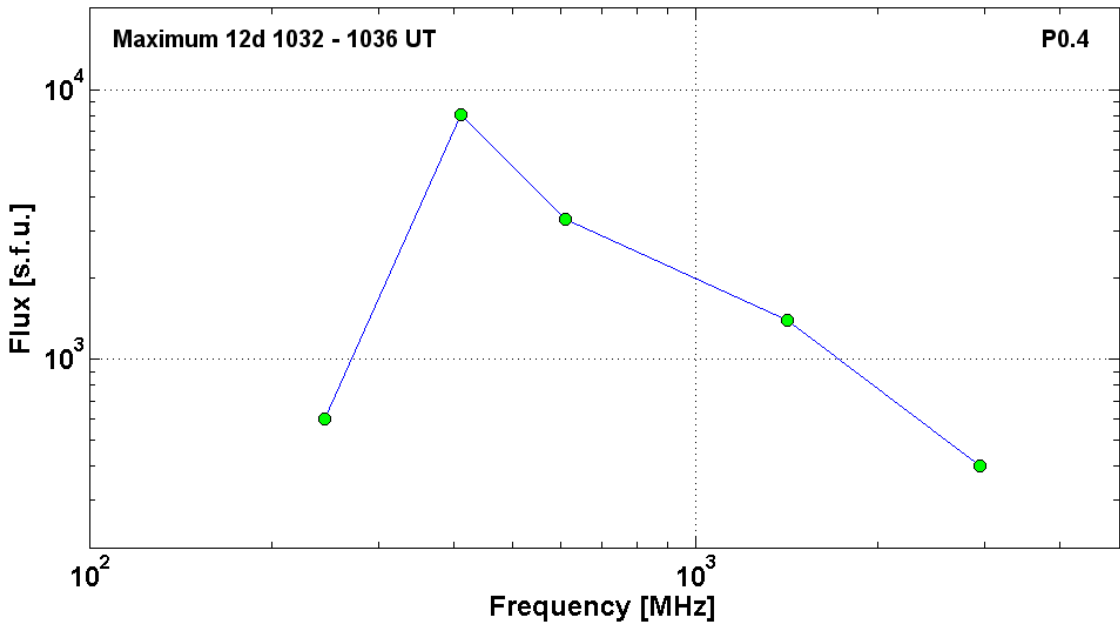
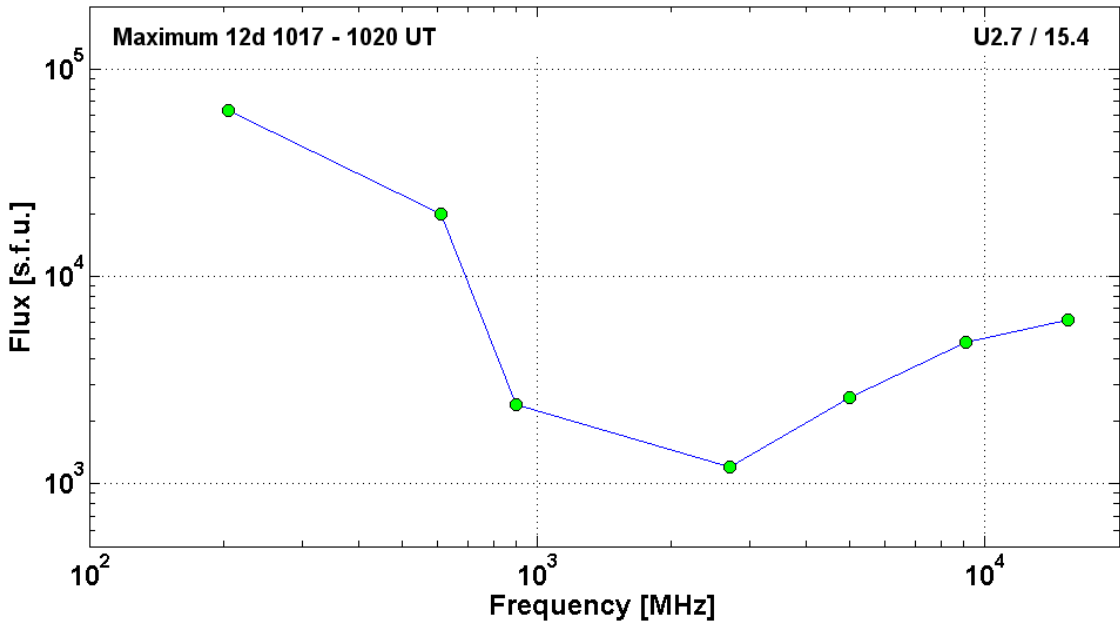
Main X-ray burst 1–8 Å: onset – 12d09^h39^m, max – 12d10^h28^m, Φ = 0.3 J/m²

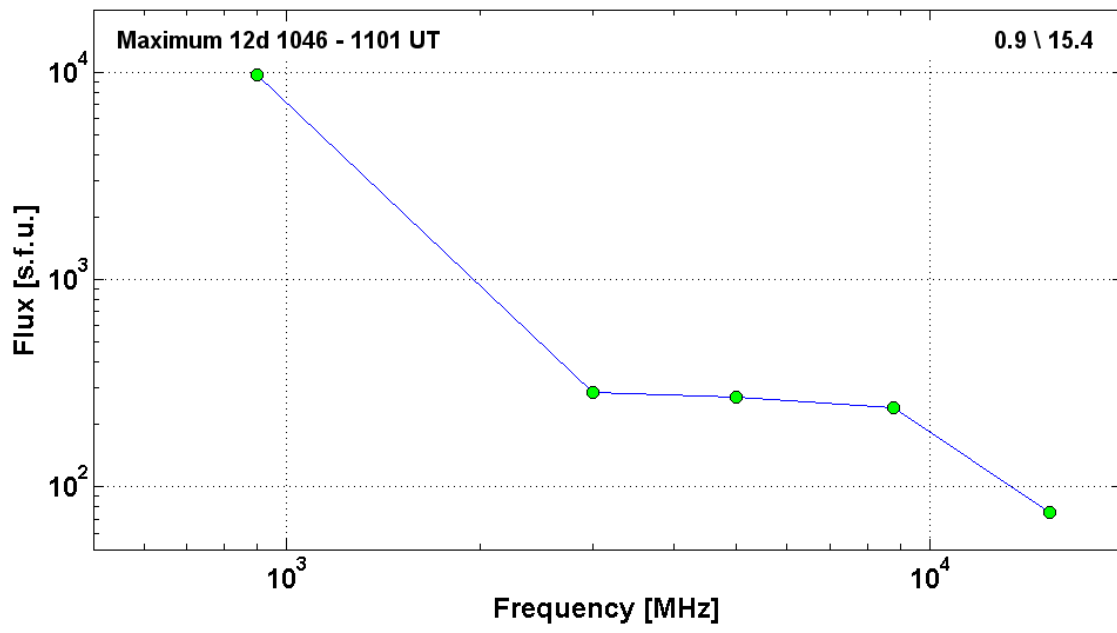
CME: 12d10^h31^m, V= 1184km/s, Δφ = 360°, dA = 221°

▲ SC 13d07^h34^m

2001	April 12	●	AR9415	To event 392			
Hα	6563 Å	<1018	1040	1130	S23W42	2B	E
1 – 12	keV	0939	1028	1049		X2.0	3.0E-1
53 – 93	keV	101058	102042	115042		79	Y
15.4	GHz	1014.0	1017.0	1050.0	U2.7 / 15.4	3.79	
9.1	GHz	1009.0	1020.5			3.68	
5	GHz	1014.0	1020.0	1052.0		3.41	
2.7	GHz	1014.0	1017.0	1052.0		3.08	
900	MHz	1013.6	1018.2	1110.0		3.38	
610	MHz	1014.0	1020.0	1100.0		4.30	
204	MHz	1014.8	1018.5	1022.1		4.80	
DS II	SH,H	~1017		~1038	40-250	3	
DS IV		1014		~1116	40-800	3	
DS I	N,C	1019		>1230	25-270	2	
DS III	GG,RS	1014		1038	1415-3200	2	
DS III	N	1017		1047	25-180	3	
DS DCIM	GG	1014		1055	2000-4500	3	
DS DCIM	GG,FS	1014		1059	800-2000	3	
3	GHz	1013.8	1032.3			2.60	
1.4	GHz	1014.0	1036.0	1052.0		3.15	
610	MHz	<1029.0	~1036.0	>1100.0		3.52	
410	MHz	1015.0	1036.0	1101.0	P0.4	3.91	
245	MHz	<1029.0	~1033.0	>1100.0		2.78	
245	MHz	1028.0	1033.0	0000.0		2.78	
DS II	HARM	1031		1034	135-210	2	
DS IV		1032		1341	25-180	1	
DS III	S	1027		1038	130-270	2	
15.4	GHz	<1046.0	~1101.0	>1102.0	0.9 \ 15.4	1.88	
8.8	GHz	<1029.0	~1047.0	>1102.0		2.38	

5	GHz	<1029.0	~1047.0	>1056.0		2.43	
3	GHz	1045.8	1047.3	1158.6		2.46	
900	MHz	1013.6	1046.5			3.99	
DS III	G	1046		1047	40-155	3	
DS CONT		1046		2233	30-80	2	
DS DCIM	GG	1102		1129	800-2000	2	
CME		1031	1184 km/s	-20.0 km/s ²	360°	221°	





PART 2. Event 2001.04.15 – (2001-105) – GLE-60

Particle event: To(Ep>10 MeV) – 15d14^h

Tmax₁(Ep>10 MeV) – 15d16^h, Jmax₁(Ep>10 MeV) – 270 /cm².s.sr

Tmax₂(Ep>10 MeV) – 15d23^h, Jmax₂(Ep>10 MeV) – 340 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – E max₁ = 300 MeV

– E max₂ = 80 MeV

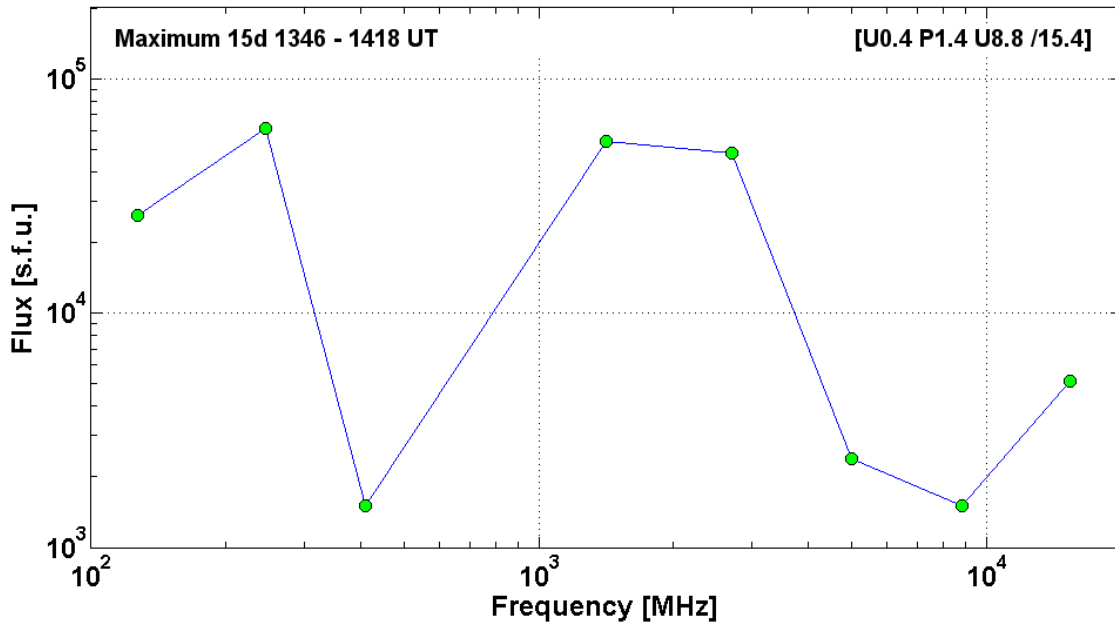
Sources: • solar flare 15d13^h19^m, X14.4/2B, S20W84, AR9415

Main X-ray burst 1–8 Å onset – 15d13^h19^m, max – 15d13^h50^m, Φ = 0.3 J/m²

CME: 15d14^h06^m, V=1199 km/s, Δφ = 167°, dA= 268°

Δ SC 18d00^h46^m

2001	April 15	•	AR9415	To event 393			
Hα	6563Å	1336	1349	1529	S20W84	2B	FHY
1 – 12	keV	1319	1350	1355		X14.4	3.0E-1
53 – 93	keV	133534	134902	144407		376	Y
1.2 – 5.6	MeV	133534	134634	144407		116	Y
15.4	GHz	1334.0	1349.0	1521.0		3.71	
8.8	GHz	1334.0	1349.0	1521.0		3.18	
5	GHz	1333.0	1346.0	1521.0		3.38	
2.7	GHz	1333.0	1417.0	1521.0		4.68	
1.4	GHz	1345.0	1418.0	1521.0	[U0.4 P1.4 U8.8/15.4]	4.73	
410	MHz	1346.0	1347.0	1514.0		3.18	
245	MHz	1346.0	1347.0	1424.0		4.79	
127	MHz	1346.5	1349.4	1406.5		>4.41	
DS II		1347		1350	25-180	3	
DS IV		1352		1505	30-80	3	
DS IV	RS	~1406		~1519	40-800	3	
DS III	N	1344		1522	25-180	2	
DS DCIM	GG	1331		1552	2000-4500	3	
DS DCIM	GG	1332		1615	800-2000	2	
CME		1031	1184 km/s	-35.9 km/s ²	360°	221°	



PART 2. Event 2001.04.18 – (2001-108) – GLE-61

Particle event: To($E_p > 10$ MeV) – 18d03^h

Tmax($E_p > 10$ MeV) – 18d10^h, Jmax ($E_p > 10$ MeV) – 190 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax = 2850 MeV

Sources: ☐ solar flare 18d02^h11^m, C2.2, s20w90*, AR9415 3d behind W-limb

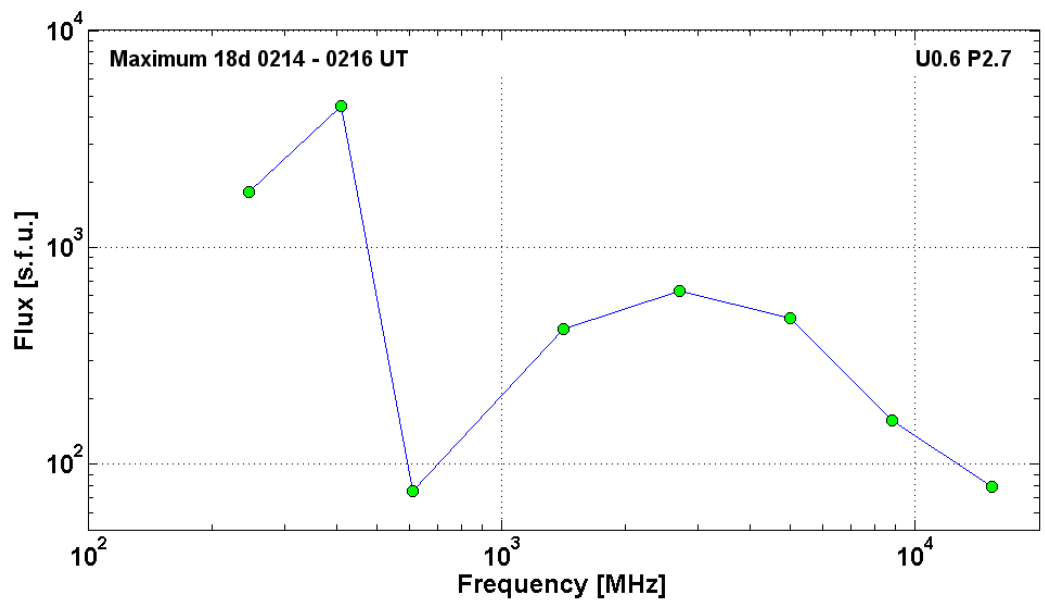
Main X-ray burst 1–8 Å: onset – 18d02^h 11^m, max – 18d02^h14^m, $\Phi = 0.0004$ J/m²

CME: 18d02^h30^m, V=2465 km/s, $\Delta\phi = 360^\circ$, dA = 263^o

Δ SC 21d16^h01^m

* – probable localization of the flare event

2001	April 18	☐			AR9415	To event 394	
H α	6563 Å	No data			s20w90		
1 – 12	keV	0211	0214	0216		C2.2	4.0E-4
53 – 93	keV	021343	021443	021755		20	Y
15.4	GHz	0213.0	0214.0	0219.0		1.90	
8.8	GHz	0213.0	0214.0	0219.0		2.20	
5	GHz	0213.0	0214.0	0221.0		2.67	
2.7	GHz	0213.0	0215.0	0217.0	U0.6 P2.7	2.80	
1.4	GHz	0213.0	0215.0	0218.0		2.62	
610	MHz	0215.0	0216.0	0217.0		1.88	
410	MHz	0214.0	0214.0	0221.0		3.65	
245	MHz	0214.0	0214.0	0215.0		3.26	
DS II		0217		0246	25-500	3	
DS III	G	0214		0216	23-480	3	
DS CONT		0216		0221	300-470	1	
CME		0230	2465 km/s	-9.5 km/s ²	360 ^o	263 ^o	0230



Part 2. Event 2001.04.27 – (2001-117)

Particle event: To(Ep>10 MeV) – 27d03^h

Tmax(Ep>10 MeV) – 28d05^h, Jmax (Ep>10 MeV) – 15 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 100 MeV

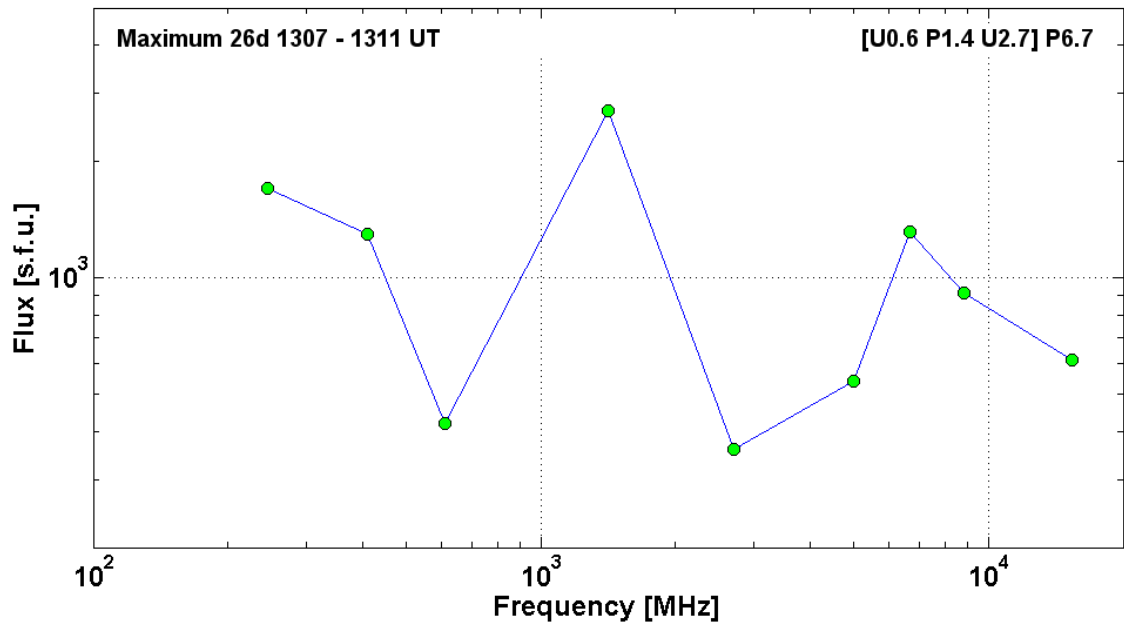
Sources: ● solar flare 26d11^h26^m, M7.8/2B, N17W31, AR9433

Main X-ray burst 1–8 Å: onset – 26d11^h 26^m, max – 26d13^h 12^m, Φ = 0.092 J/m²

CME 26d12^h 30^m, V=1006 km/s, Δφ = 360°; dA = 037°;

▲ SC 28d05^h00^m

2001	April 26	●	AR9433	To event 395			
Hα	6563 Å	1211	1311	1618	N17W31	2B	FZT
1 – 12	keV	1126	1312	1319		M7.8	9.2E-2
53 – 93	keV	<115658	~115658	122528		8	Y
53 – 93	keV	<130816	131007	131904		26	Y
15.4	GHz	1307.0	1310.0	1333.0		2.79	
8.8	GHz	1307.0	1310.0	1333.0		2.96	
6.7	GHz	1305.2	1310.2	1312.0	[U0.6 P1.4 U2.7] P6.7	3.12	
5	GHz	1307.0	1309.0	1333.0		2.73	
2.7	GHz	1307.0	1307.0	1317.0		2.56	
1.4	GHz	1307.0	1308.0	1333.0		3.43	
610	MHz	1307.0	1310.0	1333.0		2.62	
410	MHz	1307.0	1308.0	1312.0		3.11	
245	MHz	1307.0	1311.0	1323.0		3.23	
DS II		1335		1339	38-50	2	
DS IV		1341		2314	30-80	2	
DS III		1309		1310	30-80	2	
DS CONT		1241		1341	25-180	1	
DS DCIM	GG	1222		1312	800-2000	3	
DS DCIM	GG	1307		1311	2000-4500	3	
CME		1230	1006km/s	21.1 km/s ²	360°	037°	



PART 2. Event 2001.05.07 – (2001-127)

Particle event: To(Ep>10 MeV) – 07d14^h

Tmax₁(Ep>10 MeV) – 07d18^h, Jmax₁(Ep>10 MeV) – 7.7 /cm².s.sr

Tmax₂(Ep>10 MeV) – 08d12^h, Jmax₂(Ep>10 MeV) – 11.5 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 85 MeV

– Emax₂ = 85 MeV

Sources: ☐ activity of AR9433 5d behind West limb

☑ CME: 7d12^h06^m, V=1223 km/s, Δφ =205°, dA= 267°

2001	May 7		☐	AR9433		To event 396	
CME		1206	1223 km/s	19.2 km/s ²	205°	267°	

PART 2. Event 2001.05.20 – (2001-140)

Particle event: To(Ep>10 MeV) – 20d07^h

Tmax(Ep>10 MeV) – 20d10^h, Jmax (Ep>10 MeV) – 1.8 /cm².s.sr

Duration of the event – 3 days

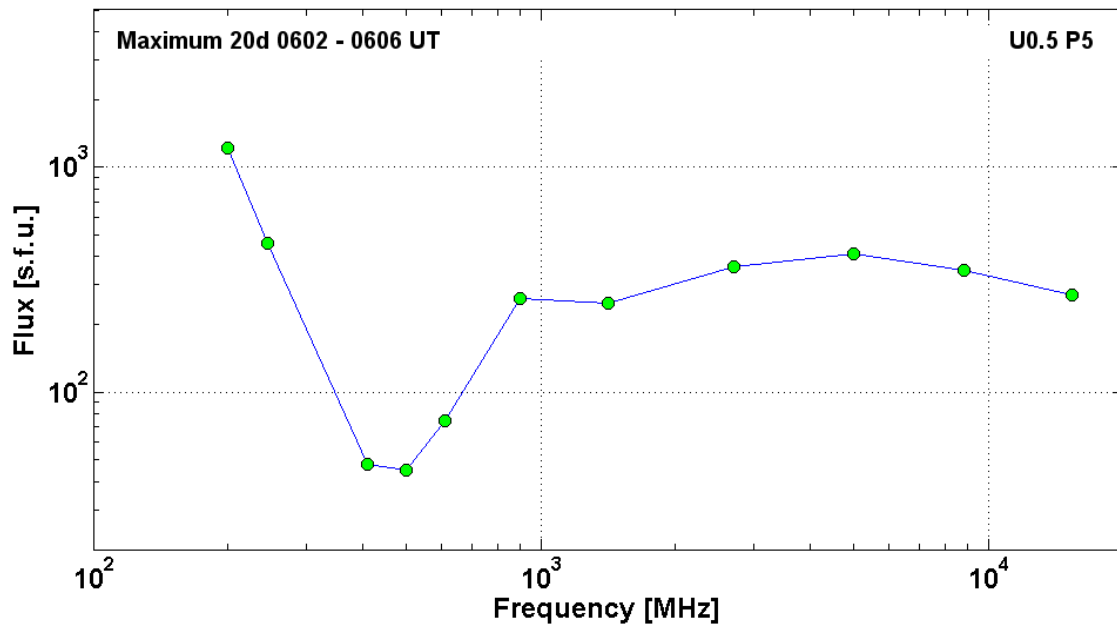
Maximum recorded proton energy of the event – Emax = 410 MeV

Sources: • solar flare 20d06^h00^m, M6.4/..., s18w90, AR9455

Main X-ray burst 1–8 Å: onset – 20d06^h 00^m, max – 20d06^h 03^m, Φ = 0.012 J/m²

CME: 20d06^h26^m, V=546 km/s, Δφ = 179°; dA = 231°

2001	May 20	•			AR9415	To event 397	
Hα	6563 Å	No Flare			s18w90		
1 – 12	keV	0600	0603	0606		M6.4	1.2E-2
53 – 93	keV	054613	060253	060739		52	Y
15.4	GHz	0601.0	0602.0	0603.0		2.43	
8.8	GHz	0601.0	0602.0	0605.0		2.54	
5	GHz	0601.0	0602.0	0605.0	U0.5 P5	2.61	
2.7	GHz	0602.0	0602.0	0606.0		2.56	
1.4	GHz	0602.0	0602.0	0607.0		2.40	
900	MHz	0601.5	0603.4	0604.2		2.41	
610	MHz	0602.0	0603.0	0605.0		1.88	
500	MHz	0601.0	0604.0	0613.0		1.65	
410	MHz	0602.0	0602.0	0603.0		1.68	
245	MHz	0602.0	0605.0	0607.0		2.66	
200	MHz	0604.0	0606.0	0606.0		3.09	
DS II	SH	0605		0624	25-340	3	
DS III	G	0602		0604	25-300	3	
DS CONT		0613		0655	23-180	1	
DS DCIM	G	0601		0605	800-2000	2	
CME		0626	546 km/s	-0.1 km/s ²	179°	231°	



PART 2. Event 2001.06.15 – (2001-166)

Particle event: To(Ep>10 MeV) – 15d16^h

Tmax₁(Ep>10 MeV) – 15d20^h, Jmax₁(Ep>10 MeV) – 5 /cm².s.sr

Tmax₂(Ep>10 MeV) – 16d06^h, Jmax₂(Ep>10 MeV) – 8.1 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 340 MeV

– Emax₂ = 120 MeV

Sources: □ activity behind West limb

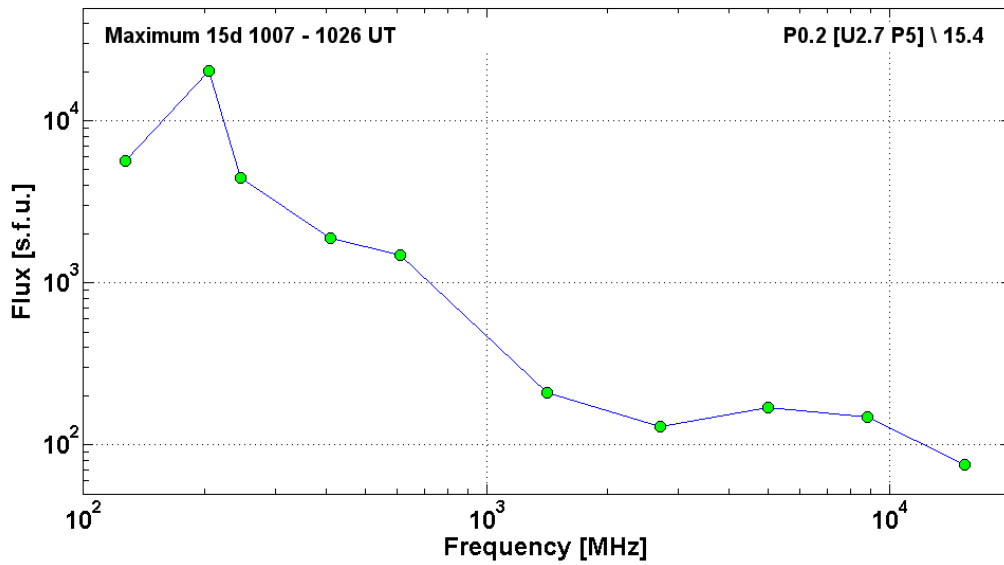
▣ CME 15d15^h56^m, V=1701 km/s, Δφ = 360°; dA = 255°;

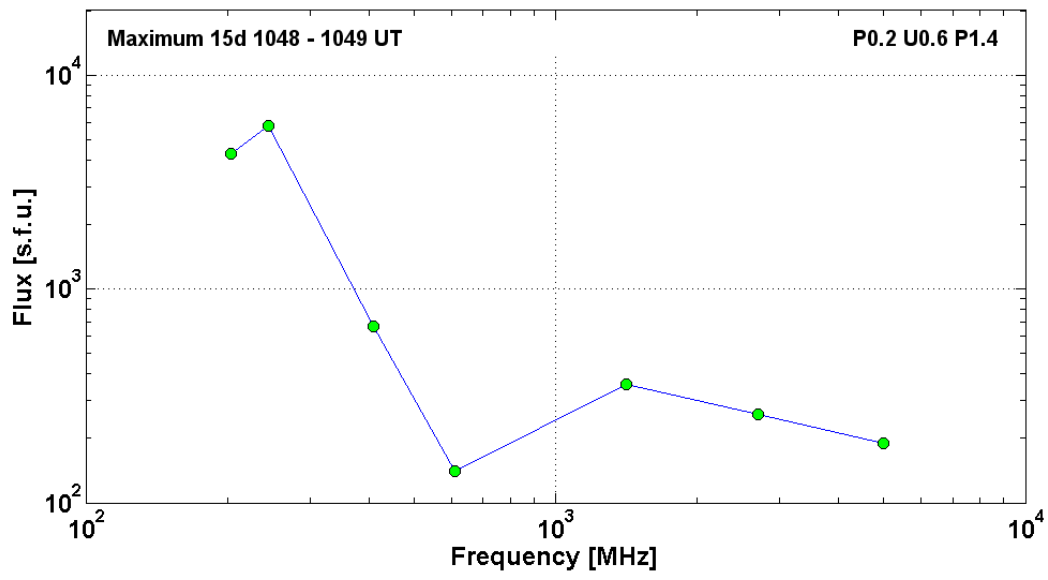
○ solar flare 15d10^h01^m, M6.3/1N, S26E42 AR9502

2001	June 15	▣	AR	To event 398		
CME	1556	1701 km/s	56.9* km/s ²	360°	255°	

2001	June 15	○	AR9502			To event 398	
Hα	6563 Å	1005	1008	1108	S26E41	1N	FH
1 – 12	keV	1001	1013	1020		M6.3	4.2E-2
53 – 93	keV	<102103	102103	104949		13	Y
15.4	GHz	1006.0	1007.0	0000.0		1.88	
8.8	GHz	1005.0	1007.0	0000.0		2.18	
5	GHz	1004.0	1007.0	0000.0	P0.2 [U2.7 P5]\15.4	2.23	
2.7	GHz	1005.0	1011.0	0000.0		2.11	
1.4	GHz	1006.0	1012.0	1023.0		2.32	
610	MHz	1008.0	1010.0	1029.0		3.18	
410	MHz	1006.0	1012.0	0000.0		3.28	
245	MHz	1006.0	1013.0	0000.0		3.65	
204	MHz	1007.2	1008.2	1041.4		4.31	
127	MHz	1004.0	1026.0	1117.0		3.76	
DS II	H	1006		1011	110-460	3	
DS IV		1009		~1026	45-270	2	
DS III	G,HARM	1007		1011	25-270	2	
DS CONT		1008		~1010	45-240	2	
DS DCIM	GG	1004		1038	2000-4500	2	
DS DCIM	GG	1005		1037	800-2000	2	
DS DCIM	P,S,F	1008		1121	110-2800	3	

5	GHz	1047.0	1049.0	0000.0		2.28	
2.7	GHz	1047.0	1049.0	0000.0		2.41	
1.4	GHz	1047.0	1048.0	0000.0	P0.2 U0.6 P1.4	2.56	
610	MHz	1047.0	1048.0	0000.0		2.15	
410	MHz	1047.0	1049.0	0000.0		2.83	
245	MHz	1006.0	1048.0	0000.0		3.76	
204	MHz	1041.9	1048.5	1129.2		3.63	
DS II		1047		1049	54-65	2	
DS IV		1046		~1120	45-270	2	
DS III	G	1047		1048	25-100	2	
DS DCIM	GG	1047		1118	2000-4500	2	
DS DCIM	GG	1047		1121	800-2000	2	
CME		1032	1090 km/s	9.7 km/s ²	119°	153°	





PART 2. Event 2001.08.09 – (2001-221)

Particle event: To(Ep>10 MeV) – 09d20^h

Tmax(Ep>10 MeV) – 0d11^h, Jmax (Ep>10 MeV) – 6 /cm².s.sr

Duration of the event – 1.5 days

Maximum recorded proton energy of the event – Emax = 85 MeV

Sources: □ activity behind West limb: AR9557, 1d behind W-limb

▣ CME 09d10^h32^m, V=0479 km/s, Δφ = 175°, dA = 255°

○ solar flare 09d11^h16^m, C3.7/SF (DSF)

2001	August 09		□	AR9557	To event 399		
SPY	6365 Å	1045		>1101	S14W90		
CME		1032	479 km/s	4.4 km/s ²	175°	255°	

2001	August 09		○	AR	To event 399		
Hα	6365 Å	1128	1136	1150	N10E54	SF	F
1 – 12	keV	1116	1122	1127		C3.7	2.1E-3
3	GHz	1118.5	1118.9	1120.2		1.46	
DS CONT		1118		1119	2273-4500	1	
DS DCIM	C	1118		1119	2000-4000	2	
DSF*		<1032					
CME		1032	479 km/s	4.4 km/s ²	175°	255°	

PART 2. Event 400: 2001.08.16 – (2001-228)

Particle event: To(Ep>10 MeV) – 16d00^h

Tmax₁(Ep>10 MeV) – 16d03^h, Jmax₁(Ep>10 MeV) – 87 /cm².s.sr

Tmax₂(Ep>10 MeV) – 17d12^h, Jmax₂(Ep>10 MeV) – 75 /cm².s.sr

Duration of the event – 13 days

Maximum recorded proton energy of the event – Emax₁ = 600 MeV

– Emax₂ = 475 MeV

Sources: ☐ activity behind West limb: AR9557, ~5d behind W-limb

☐ CME: 15d23^h54^m, V=1575 km/s, Δφ = 360°; dA = 189°

▲ SC 17d11h03^m

2001	August 15	☐	AR		To event 400
CME	2354	1575 km/s	31.7 km/s ²	360°	189°

PART 2. Event 2001.09.15 – (2001-258)

Particle event: To(Ep>10 MeV) – 15d12^h

Tmax(Ep>10 MeV) – 15d15^h, Jmax(Ep>10 MeV) – 6 /cm².s.sr

Duration of the event – 2 days

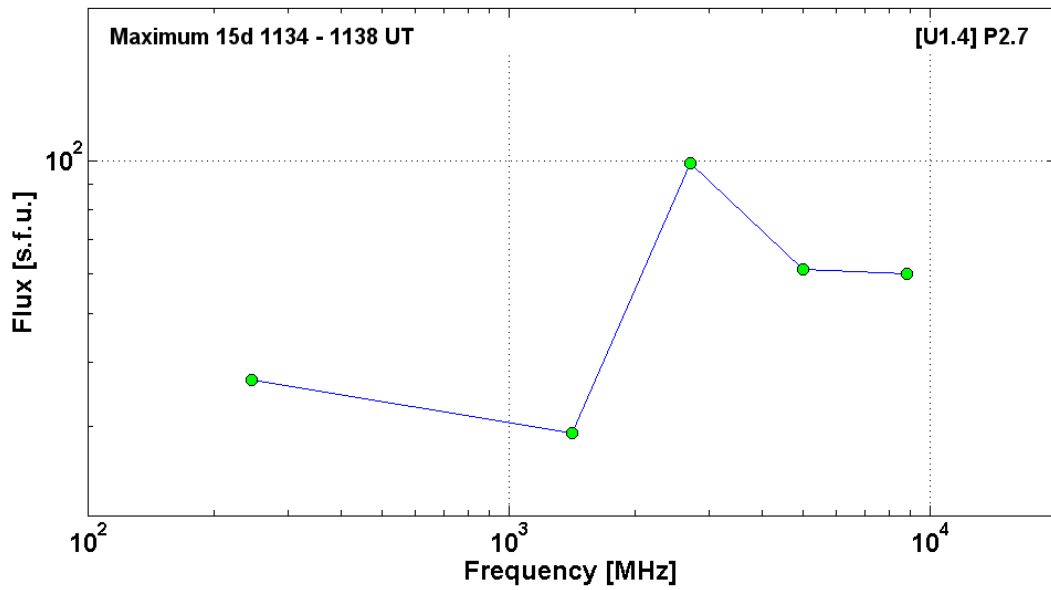
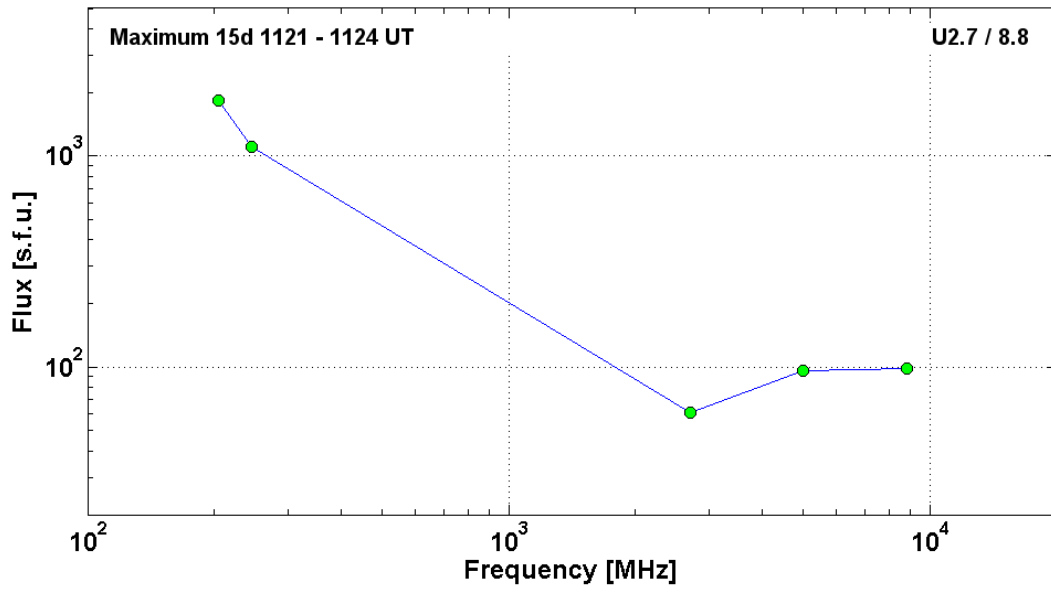
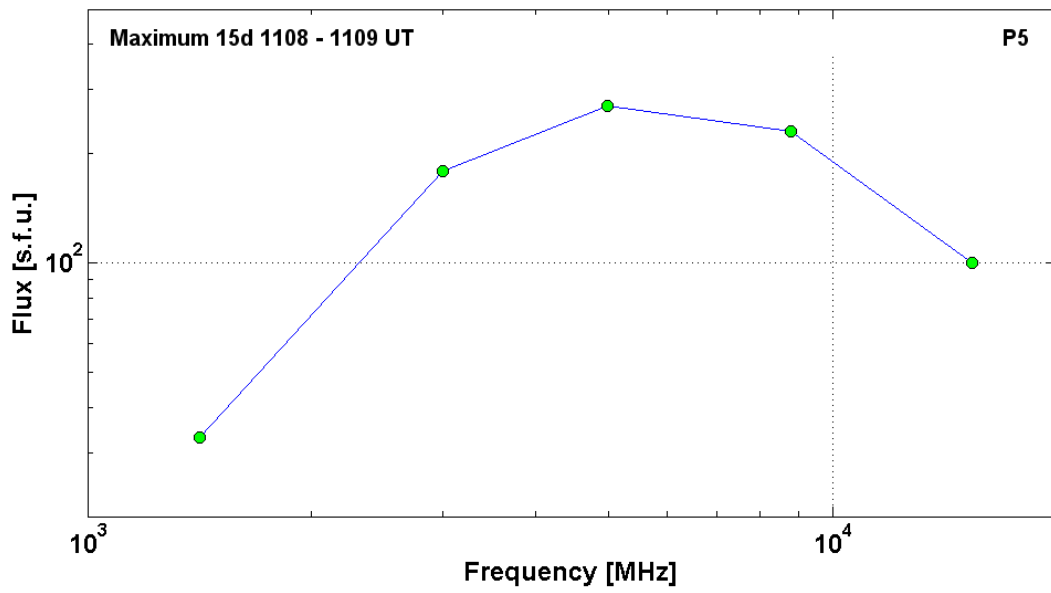
Maximum recorded proton energy of the event – Emax = 150 MeV

Sources: • solar flare 15d11^h28^m, M1.5/1N, S21W49, AR9608

Main X-ray burst 1–8 Å: onset – 15d11^h04^m, max – 15d11^h28^m, Φ = 0.037 J/m²

CME: 15d11^h54^m, V=0478 km/s, Δφ = 130°, dA = 248°

2001	September 15	•	AR9608	To event 401			
Hα		1103	1109	1237	S21W49	1N	
Hα		<1124	~1139	1230	S27W53	SF	
1 – 12	keV	1004	1128	1154		M1.5	3.7E-2
53 – 93	keV	<113224	113332	114002		8	Y
15.4	GHz	1107.0	1108.0	1109.0	P5	2.00	
8.8	GHz	1106.0	1108.0	1119.0		2.36	
5	GHz	1107.0	1108.0	1111.0		2.43	
3	GHz	1106.6	1108.9	1154.1		2.25	
1.4	GHz	1109.0	1109.0	1110.0		1.52	
DS DCIM	G	1106		1143	2000-4500	2	
DS DCIM	G	1107		1141	800-2000	1	
8.8	GHz	1119.0	1121.0	1132.0	U2.7 / 8.8	2.00	
5	GHz	1120.0	1122.0	1128.0		1.98	
2.7	GHz	1120.0	1122.0	1129.0		1.79	
245	MHz	1121.0	1124.0	1131.0		3.04	
204	MHz	1124.5	1124.9	1126.2		3.26	
DS II	GG,FS	1121		1128	30-220	2	
DS III	GG	1123		1126	30-270	2	
DS CONT		1124		1459	25-180	1	
8.8	GHz	1132.0	1134.0	1139.0		1.78	
5	GHz	1132.0	1134.0	1137.0		1.79	
2.7	GHz	1132.0	1134.0	1139.0	[U1.4] P2.7	2.00	
1.4	GHz	1134.0	1136.0	1137.0		1.46	
245	MHz	1138.0	1138.0	~1138.0		1.57	
DS III	N	1142		>1200	25-90	2	
CME		1154	0478 km/s	-4.0 km/s ²	130°	248°	



PART 2. Event 2001.09.24 – (2001-267)

Particle event: To(Ep>10 MeV) – 24d11^h

Tmax₁(Ep>10 MeV) – 24d18^h, Jmax₁(Ep>10 MeV) – 390 /cm².s.sr

Tmax₂(Ep>10 MeV) – 25d07^h, Jmax₂(Ep>10 MeV) – 1.1·10³ /cm².s.sr

Tmax₃(Ep>10 MeV) – 25d22^h, Jmax₃(Ep>10 MeV) – 9.5·10³ /cm².s.sr

Duration of the event – 5 days

Maximum recorded proton energy of the event – Emax₁ = 470 MeV

– Emax₂ = 585 MeV

– Emax₃ = 580 MeV

Sources: ● solar flare 24d09^h32^m, X2.6/2B, S16E23, AR9632;

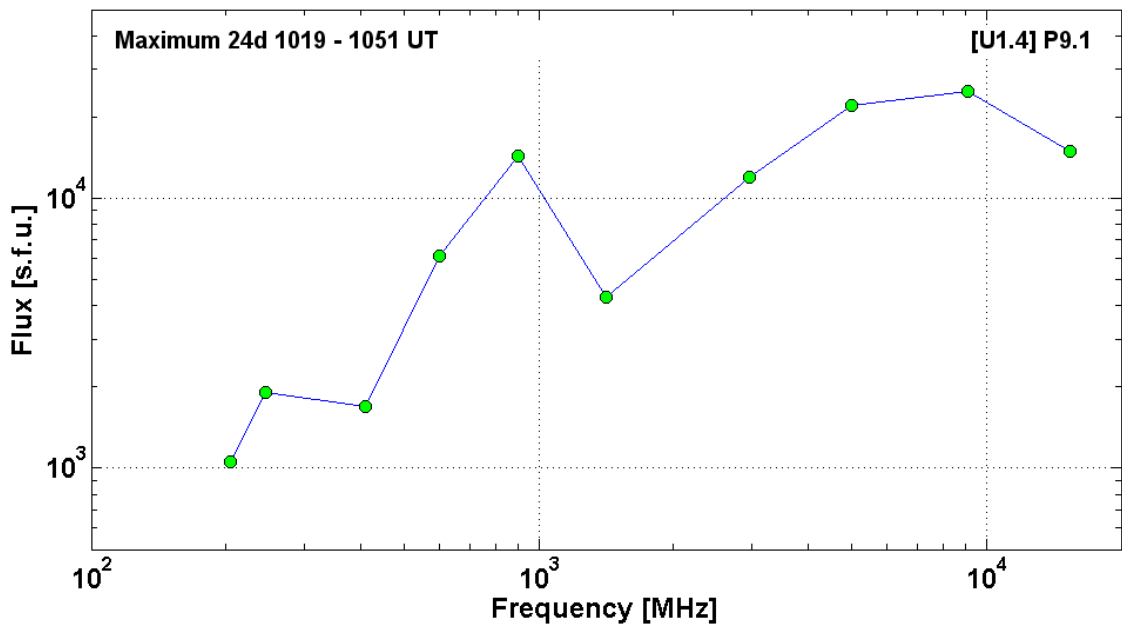
∅ solar flare 25d04^h24^m, M7.6/1N, S18W01, AR9628

Main X-ray burst 1-8 Å: onset – 24d09^h32^m, max – 24d10^h 38^m, Φ = 0.63 J/m²

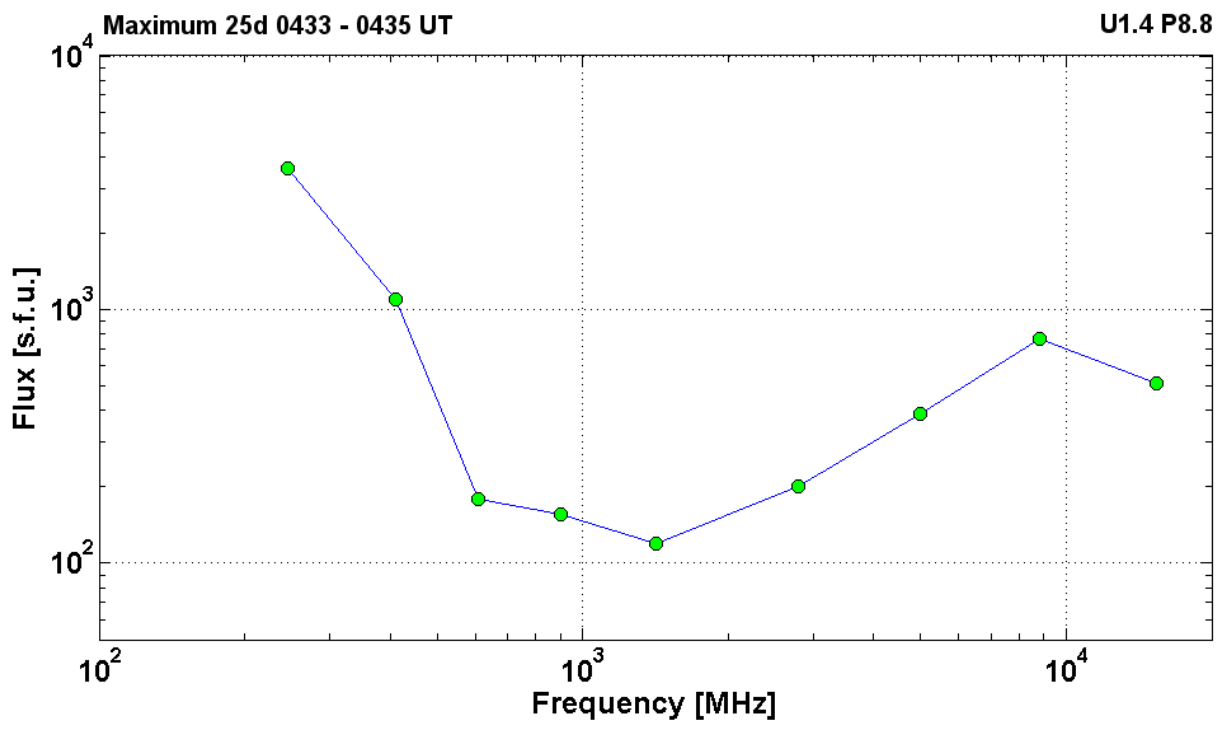
CME: 24d10^h31^m, V = 2402km/s, Δφ = 360°, dA = 142°

▲ SC 25d20^h25^m, Δ SC 29d09^h40^m

2001	September 24	●	AR9632	To event 402			
Hα		<0936	1019	1217	S16E23	2B	F
1 – 12	keV	0932	1038	1109		X2.6	6.3E-1
53 – 93	keV	094456	~101350	>101350		8	Y
53 – 93	keV	<105750	~105750	113236		8	Y
15.4	GHz	0933.0	1029.0	1203.0		4.18	
9.1	GHz	0932.0	1029.9	>1230.0	[U1.4] P9.1	4.40	
5	GHz	0933.0	1030.0	1324.0		4.34	
3	GHz	~0900.0	1031.1	>1209.0		4.08	
1.4	GHz	0957.0	1019.0	1142.0		3.63	
900	MHz	0830.0	1025.0	>1230.0		4.16	
600	MHz	0854.7	1024.7	1200.0		3.79	
410	MHz	0930.0	1024.0	1235.0		3.23	
245	MHz	0930.0	1048.0	1150.0		3.28	
204	MHz	0931.0	1051.7	1152.0		3.02	
DS IV	P,S	0959		1150	1200-3800	3	
DS IV		1018		1624	25-180	2	
DS III	GG,RS	0935		1123	1200-1700	2	
DS III	S	0937		~1017	25-270	2	
DS III	S,C	1017		~1110	25-270	3	
DS CONT		0938		1018	25-180	2	
DS CONT		~1019		~1116	40-270	3	
DS DCIM	GG	0943		1126	2000-4500	3	
DS DCIM	GG	0956		1149	800-2000	3	
CME		1031	2402 km/s	54.1 km/s ²	360°	142°	



2001	September 25	Ø		AR9628		To event 402	
H α	6563 Å	0426	0440	0506	S18W01	1N	FZ
1 – 12	keV	0424	0440	0452		M7.6	7.2E-2
53 – 93	keV	<043302	043556	051234		19	Y
15.4	GHz	0434.0	0434.0	0503.0		2.71	
8.8	GHz	0425.0	0434.0	0522.0	U1.4 P8.8	2.89	
5	GHz	0429.0	0434.0	0522.0		2.59	
2.8	GHz	0433.0	0435.0	0516.0		2.8	
1.4	GHz	0433.0	0434.0	0450.0		1.4	
900	MHz	0432.7	0434.4	0501.9		900	
610	MHz	0433.0	0434.0	0443.0		610	
410	MHz	0433.0	0434.0	0444.0		410	
245	MHz	0432.0	0433.0	0437.0		245	
DS II		0440		0456	28-120	2	DS II
DS III	G	0432		0443	80-1000	2	DS III
DS III	G	0442		0445	57-170	1	DS III
CME		0604	0750km/s	–	062°	283°	



PART 2. Event 2001.10.01 – (2001-274)

Particle event: To(Ep>10 MeV) – 01d14^h

Tmax₁(Ep>10 MeV) – 01d23^h, Jmax₁(Ep>10 MeV) – 370/cm².s.sr

Tmax₂(Ep>10 MeV) – 02d07^h, Jmax₂(Ep> 10MeV) – 1.3·10³/cm².s.sr

Duration of the event – 3.5 days

Maximum recorded proton energy of the event – Emax₁ = 155 MeV

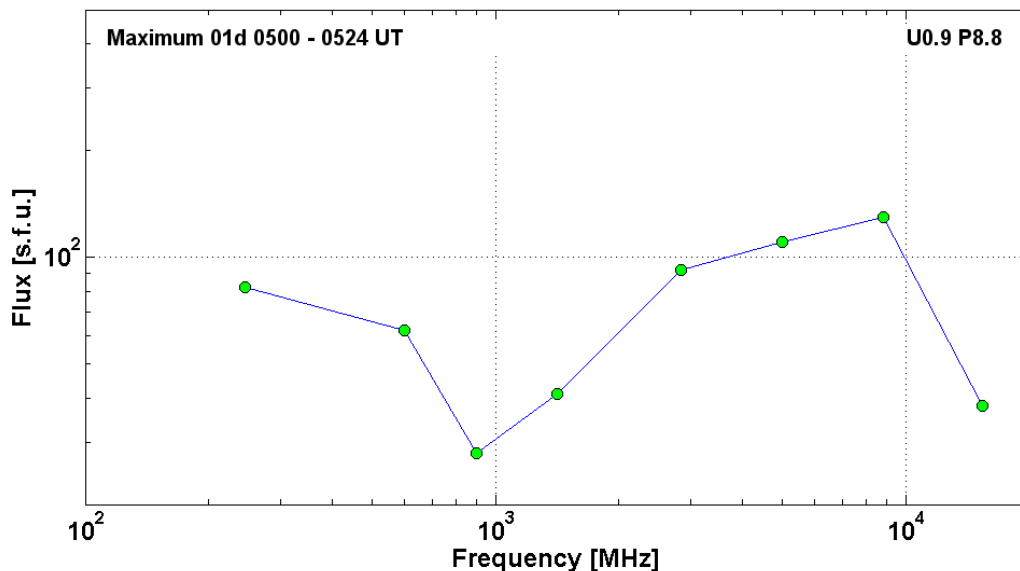
– Emax₂ = 150 MeV

Sources: ■ solar flare 01d04^h41^m, M9.1/..., s18w80, AR9628

Main X-ray burst 1-8 Å: onset – 01d04^h41^m, max – 01d05^h 15^m, Φ = 0.086 J/m²

CME: 01d05^h30^m, 1405 km/s, Δφ = 360°, dA = 225°

2001	October 01	●			AR9628	To event 403	
Hα	6563 Å	No Flare Patrol			s18w80		
1 – 12	keV	0441	0515	0523		M9.1	8.6E-2
53 – 93	keV	045617	051221	052017		8	Y
15.4	GHz	0500.0	0500.0	~0500.0		1.58	
8.8	GHz	<0509.0	~0511.0	>0515.0	U0.9 P8.8	2.11	
5	GHz	0459.0	0500.0	0501.0		2.04	
2.8	GHz	0449.0	0511.9	0533.0		1.96	
1.4	GHz	<0511.0	~0513.0	>0514.0		1.61	
900	MHz	0511.7	0511.9	0534.6		1.45	
600	MHz	~0511.6	0515.2	>0533.0		1.79	
245	MHz	0524.0	0524.0	~0524.0		1.91	
DS III	N	0451		0529	57-160	1	
DS III	G	0522		0525	57-220	2	
DS III	S,C	0529		>0755	57-750	3	
CME		0530	1405 km/s	97.8 km/s ²	360°	225°	



PART 2. Event 2001.10.19 – (2001-292)

Particle event: To($E_p > 10$ MeV) – 19d02^h

$T_{max_1}(E_p > 10$ MeV) – 19d08^h, $J_{max_1}(E_p > 10$ MeV) – 3.6/cm².s.sr

$T_{max_2}(E_p > 10$ MeV) – 19d21^h, $J_{max_2}(E_p > 10$ MeV) – 8/cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – $E_{max_1} = 300$ MeV

– $E_{max_2} = 310$ MeV

Sources: • solar flare 19d00^h47^m, X1.6/2B, N16W18, AR9661*

M1.2/2B, N16W18, AR9661*

Ø solar flare 19d16^h13^m, X1.6/2B, N15W30, AR9661

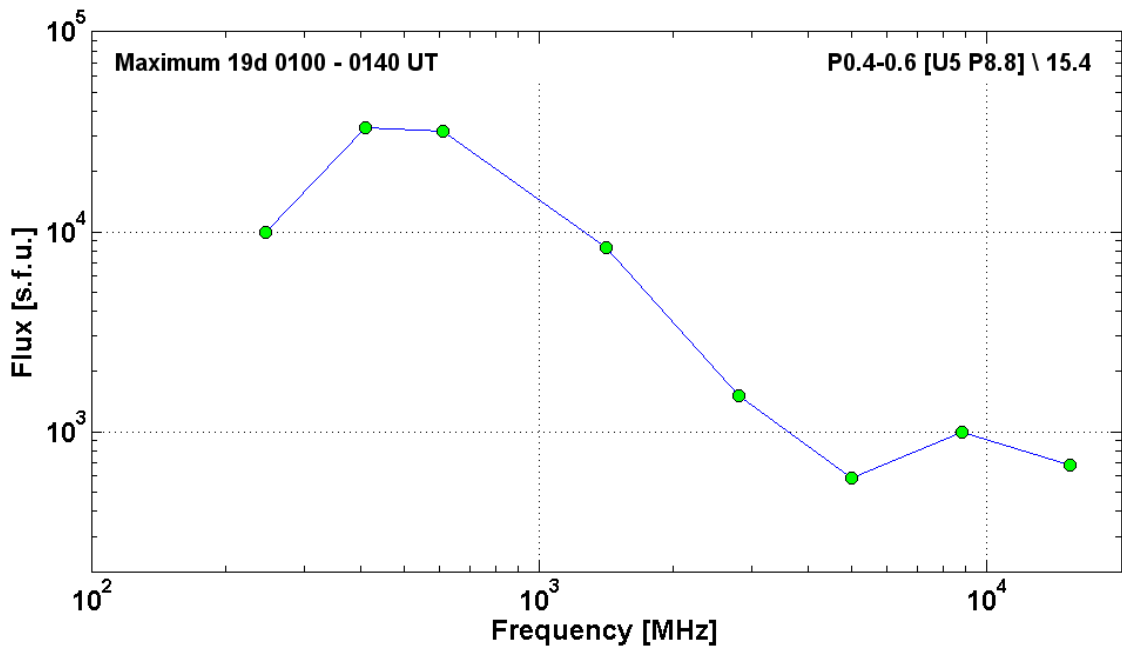
Main X-ray burst 1–8 Å: onset – 19d00^h 47^m, max – 19d01^h 05^m, $\Phi = 0.12$ J/m²

CME: 19d01^h27^m, $V = 0558$ km/s, $\Delta\phi = 360^\circ$, $dA = 284^\circ$

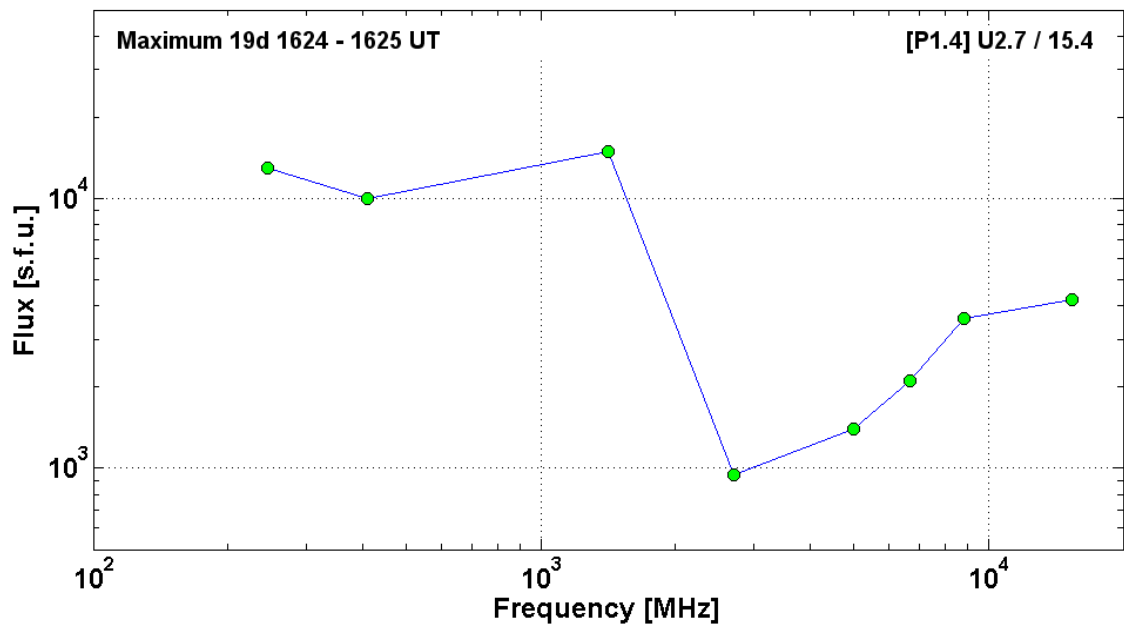
Δ SC 21d16^h48^m

* One flare event with two X-ray bursts

2001	October 19	•	AR9691		To event 404		
H α	6563 Å	0049	0059	0355	N16W18	2B	EZ
1 – 12	keV	0047	0105	0113		X1.6	1.2E-1
1 – 12	keV	0220	0232	0246		M1.2	1.8E-2
15.4	GHz	0053.0	0100.0	0237.0		2.83	
8.8	GHz	0049.0	0100.0	0237.0	P0.4-0.6 [U5 P8.8]\15.4	3.00	
5	GHz	0050.0	0100.0	0239.0		2.77	
2.8	GHz	0050.0	0126.0	0152.0		3.18	
1.4	GHz	0054.0	0124.0	0201.0		3.92	
610	MHz	0056.0	0124.0	0237.0		4.51	
410	MHz	0056.0	0140.0	0206.0		4.52	
245	MHz	0059.0	0140.0	0206.0		4.00	
DS II		0101		0119	25-220	3	
DS IV	FS	0058		>0200	57-1600	3	
DS III	S,C	~0120		0331	57-180	2	
CME		0127	0558 km/s	-25.6 km/s ²	360°	284°	



2001	October 19	Ø			AR9661	To event 404	
H α		1616	1636	1820	N15W30	2N	FUY
1 – 12	keV	1613	1630	1643		X1.6	1.6E-1
1,3-4,0	MeV						K
15.4	GHz	1614.0	1624.0	1705.0	[P1.4] U2.7 / 15.4	3.62	
8.8	GHz	1615.0	1625.0	1705.0		3.56	
6.7	GHz	1614.0	1625.0	1648.5		3.32	
5	GHz	1618.0	1625.0	1705.0		3.15	
2.7	GHz	1622.0	1625.0	1705.0		2.98	
1.4	GHz	1622.0	1624.0	1705.0		4.18	
410	MHz	1624.0	1624.0	1705.0		4.00	
245	MHz	1624.0	1624.0	1705.0		4.11	
DS II		1624		1642	25-180	2	
DS IV		1640		1704	25-180	2	
CME		1650	0901 km/s	-0.7 km/s ²	360°	273°	



PART 2. Event 2001.10.22 – (2001-295)

Particle event: To(Ep>10 MeV) – 22d16^h

Tmax(Ep>10 MeV) – 22d21^h, Jmax (Ep>10 MeV) – 17 /cm².s.sr

Duration of the event – 2.5 days

Maximum recorded proton energy of the event – Emax = 430 MeV

Sources: ● solar 22d17^h44^m, X1.2/2B, S18E16, AR9672

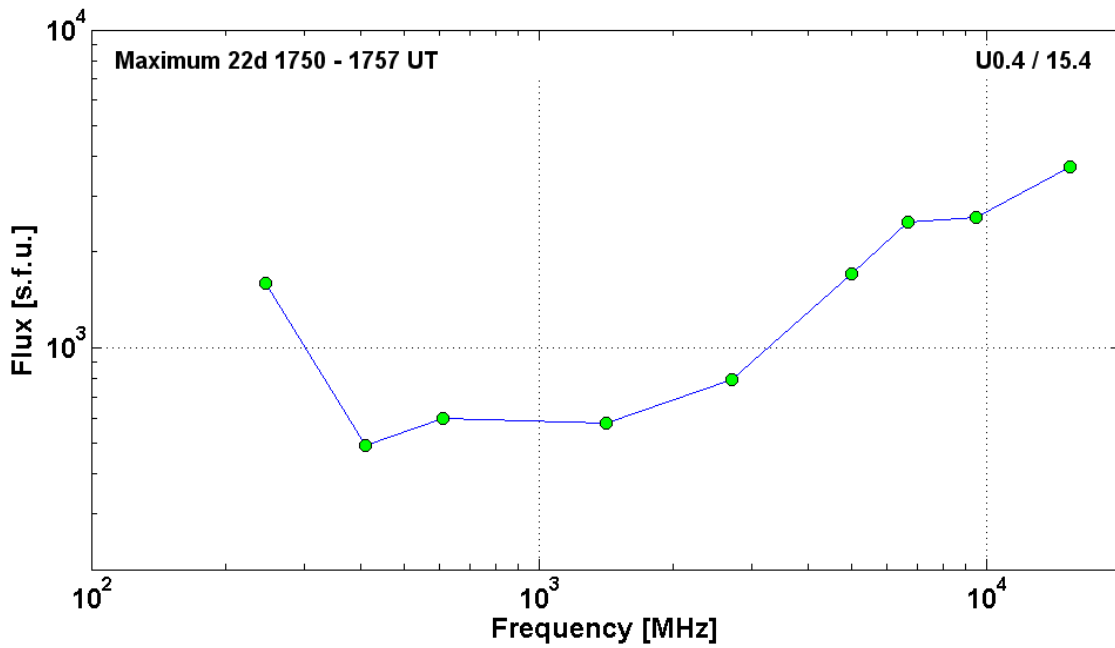
Ø solar 22d14^h16^m, 2N/M6.7, S17E20, AR9672

Main X-ray burst 1–8 Å: onset – 22d17^h44^m, max – 22d17^h59^m, Φ = 0.12 J/m²

CME: 22d18^h26^m, V = 0618 km/s, 106°, dA = 126°

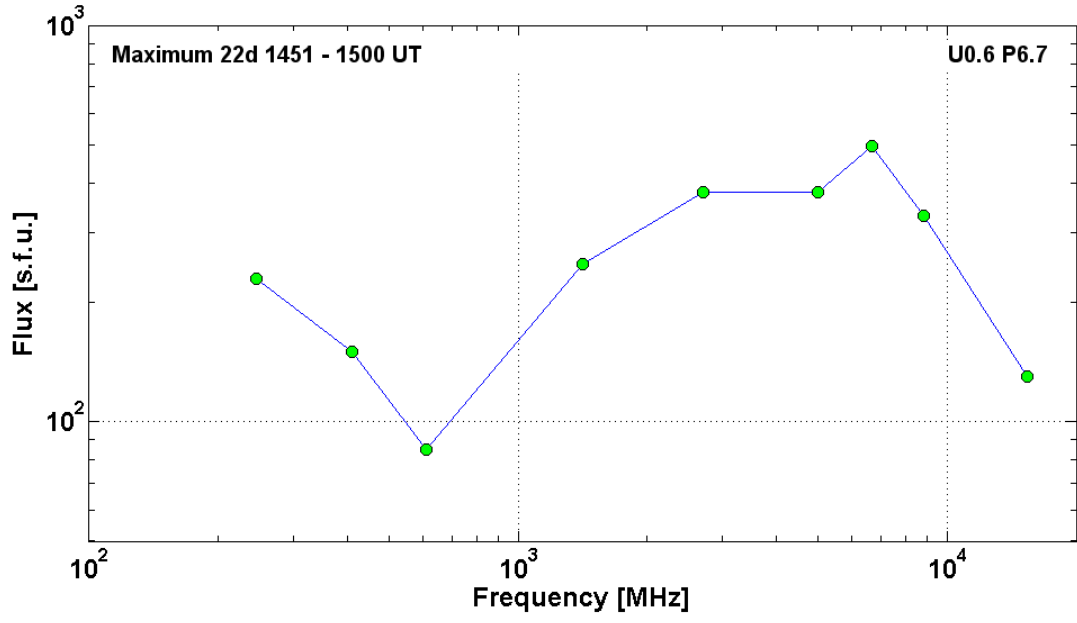
▲ SC 25d08^h50^m

2001	October 22	●			AR9672	To event 405	
Hα		1744	1758	1911	S18E16	2B	UZ
1 – 12	keV	1744	1759	1814		X1.2	1.2E-1
53 – 93	keV	<174951	175509	>180251		108	Y
15.4	GHz	1747.0	1751.0	1809.0	U0.4 / 15.4	3.57	
9.5	GHz	1740.2	1750.8	1757.5		3.41	
6.7	GHz	1739.3	1751.0	1758.8		3.39	
5	GHz	1746.0	1751.0	1809.0		3.23	
2.7	GHz	1747.0	1751.0	1808.0		2.90	
1.4	GHz	1747.0	1751.0	1808.0		2.76	
610	MHz	1751.0	1757.0	1808.0		2.78	
410	MHz	1754.0	1757.0	1801.0		2.69	
245	MHz	1755.0	1755.0	1808.0		3.20	
DS II		1759		1810	25-180	1	
DS III	N	1754		1856	25-180	1	
DSF		~1648	1930	1930		14°	
CME		1826	0618 km/s	-7.6 km/s ²	106°	126°	



2001	October 22	Ø			AR9661	To event 405	
H α		1416	1455	1552	S17E20	2N	F
1 – 12	keV	1427	1508	1531		M6.7	1.5E-1
53 – 93	keV	<143823	~144811	>144931		10	Y
15.4	GHz	1444.0	1500.0	1519.0		15.4	
8.8	GHz	1444.0	1457.0	1526.0		8.8	
6.7	GHz	1450.0	1457.4	1511.2	U0.6 P6.7	6.7	
5	GHz	1444.0	1457.0	1526.0		5	
2.7	GHz	1445.0	1457.0	1522.0		2.7	
1.4	GHz	1445.0	1500.0	1522.0		1.4	
610	MHz	1446.0	1451.0	1522.0		610	
410	MHz	1445.0	1452.0	1513.0		410	
245	MHz	1444.0	1452.0	1522.0		245	
DS II	SH	1452		1457	110-150	DS II	
DS II		1453		1513	25-142	DS II	
DS II		1456		1520	30-80	DS II	
DS IV		1445		1521	40-400	DS IV	
DS III	GG	1445		1452	40-250	DS III	
DS DCIM	C,S	1446		1509	100-4000	DS DCIM	

CME		1506	1336 km/s	-8.0 km/s ²	360°	122	
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PART 2. Event 2001.10.28 – (2001-301)

Particle event: To(Ep>10 MeV) – 28d02^h

Tmax(Ep>10 MeV) – 28d07^h, Jmax (Ep>10 MeV) – 1.1 /cm².s.sr

Duration of the event – 1day

Maximum recorded proton energy of the event – Emax = 60 MeV

Sources: unknown

○ solar flare 28d04^h36^m, M1.3/1F, N12E40, AR9682

Main X-ray burst 1-8 Å: onset – 28d04^h36^m, max – 28d05^h08^m, Φ = 0.013 J/m²

Δ SC 28d13^h19^m

2001	October 28	○		AR9661		To event 406	
Hα		0443	0448	0531	N12E40	1F	F
1 – 12	keV	0436	0450	0458		M1.3	1.3E-2
8.8	GHz	0442.0	0444.0	0502.0		1.75	

PART 2. Event 2001.11.04 – (2001-308) – GLE-62

Particle event: To(Ep>10 MeV) – 04d16^h

Tmax₁(Ep>10 MeV) – 04d20^h, Jmax₁(Ep>10 MeV) – 540/cm².s.sr

Tmax₂(Ep>10 MeV) – 06d00^h, Jmax₂(Ep>10 MeV) – 2.4·10⁴/cm².s.sr

Duration of the event – 5 days

Maximum recorded proton energy of the event – Emax₁ = 730 MeV

– Emax₂ = 705 MeV

Sources: ● solar flare 04d16^h03^m, X1.0/3B, N07W19, AR9684

∅ solar flare 04d06^h38^m, C8.4/1N, N14W57, AR9682

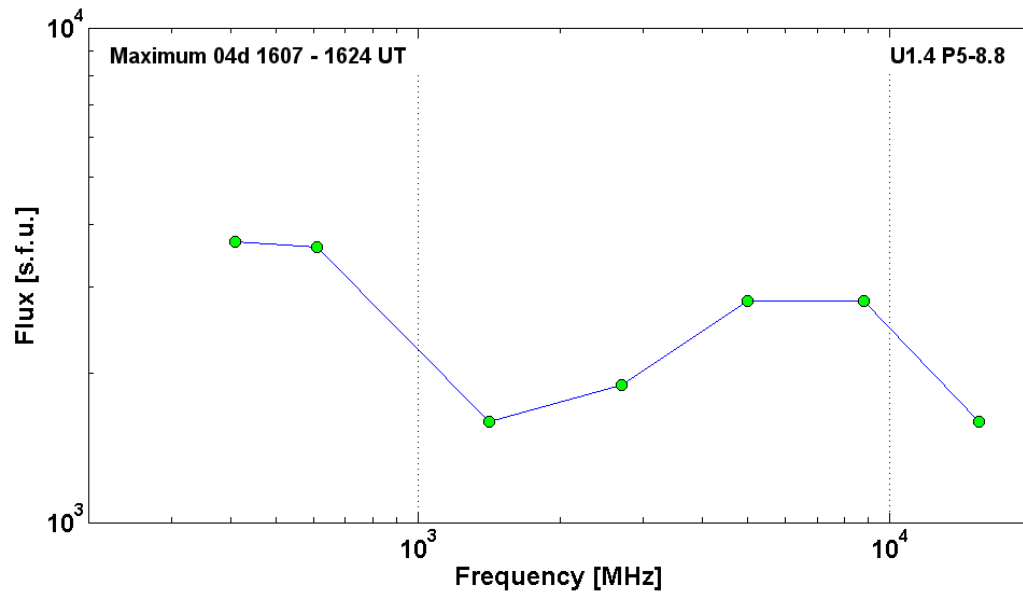
∅ solar flare 05d09^h07^m, M2.1/1N, N03W37, AR9684

Main X-ray burst 1–8 Å: onset – 04d16^h03^m, max – 04d16^h20^m, Φ = 0.22 J/m²

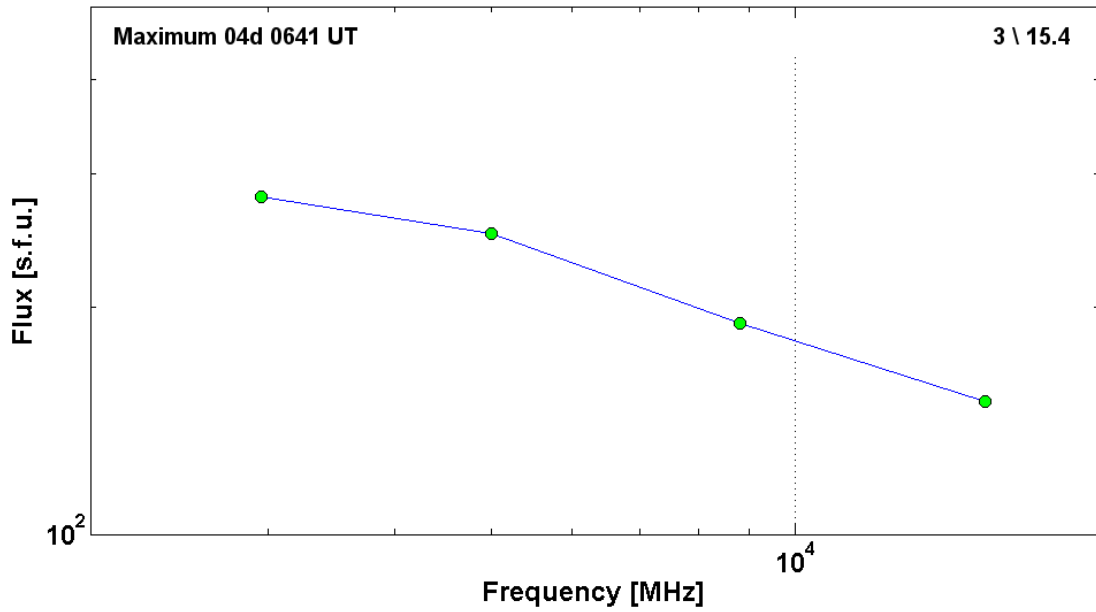
CME 04d16^h35^m, V = 1810 km/s, Δφ = 360°, dA = 239°,

▲ SC 06d01^h52^m

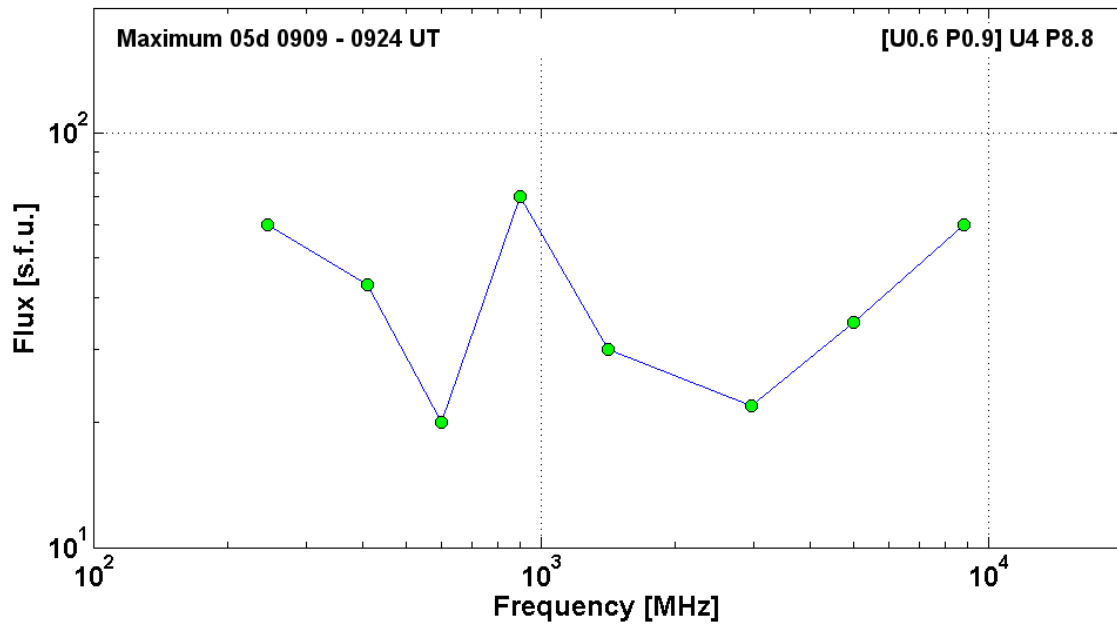
2001	November 04	●			AR9684	To event 407	
Hα		1603	1614	>2340	N07W19	3B	FUZ
1 – 12	keV	1603	1620	1657		X1.0	2.2E-1
53 – 93	keV	160256	161254	>171336		38	Y
15.4	GHz	1605.0	1617.0	1725.0		3.20	
8.8	GHz	1604.0	1616.0	0000.0	U1.4 P5-8.8	3.45	
5	GHz	1604.0	1617.0	0000.0		3.45	
2.7	GHz	1602.0	1624.0	0000.0		3.28	
1.4	GHz	1602.0	1607.0	1727.0		3.20	
610	MHz	1604.0	1609.0	1709.0		3.56	
410	MHz	1605.0	1617.0	1714.0		3.57	
DS II		1610		1621	29-180	2	
DS IV		1612		1850	36-180	1	
DS III	N	1611		1715	25-180	2	
CME		1635	1810 km/s	-63.4 km/s ²	360°	239°	



2001	November 04	Ø		AR9682		To event 407	
H α		0641	0643	0700	N14W57	1N	C
1 – 12	keV	0638	0643	0646		C8.4	2.3E-3
53 – 93	keV	064056	064306	065144		13	Y
15.4	GHz	0640.0	0641.0	0641.0	3 \ 15.4	2.18	
8.8	GHz	0640.0	0641.0	0643.0		2.28	
5	GHz	0640.0	0641.0	0643.0		2.40	
3	GHz	0640.7	0641.3	0644.1		2.45	
DS I	N	0650		>1200	110-270	1	
DS III		0639		0640	25-132	1	
CME		0750	259 km/s	0.1 km/s ²	136°	011°	



2001	November 05	Ø			AR9684	To event 407	
H α		0908	0911	0947	N03W37	1N	EFU
1 – 12	keV	0907	0915	0922		M2.1	1.6E-2
53 – 93	keV	092530	092548	092602		8	Y
8.8	GHz	0907.0	0909.0	0915.0	[U0.6 P0.9] U4 P8.8	1.78	
5	GHz	0912.0	0912.0	~0912.0		1.54	
3	GHz	0912.4	0915.0			1.34	
1.4	GHz	0908.0	0909.0	0909.0		1.48	
900	MHz	0909.0	0909.9			1.85	
600	MHz	0909.0	0909.4	0912.4		1.30	
410	MHz	0922.0	0922.0	0924.0		1.63	
245	MHz	0922.0	0924.0	0926.0		1.78	
DS II		0907		0928	190-2200	2	
DS I	N	~0906		~0955	90-180	1	
DS III	N	~0910		~0957	45-150	1	
DS III	GG	0933		0937	30-220	2	
DS DCIM	GG	0907		0910	800-2000	2	
DS UNCLF		0910		0936	200-380	1	
CME		0943	0997 km/s	-8.1 km/s ²	040°	259°	



PART 2. Event 2001.11.17 – (2001-321)

Particle event To(Ep>10 MeV) – 10^h

Tmax(Ep>10 MeV) – 19d22^h, Jmax (Ep>10 MeV) – 13/cm².s.sr

Duration of the event – 5 days

Maximum recorded proton energy of the event – Emax = 45 MeV

Sources: ● solar flare 17d04^h48^m, 2N/M2.8, S13E42, AR9704

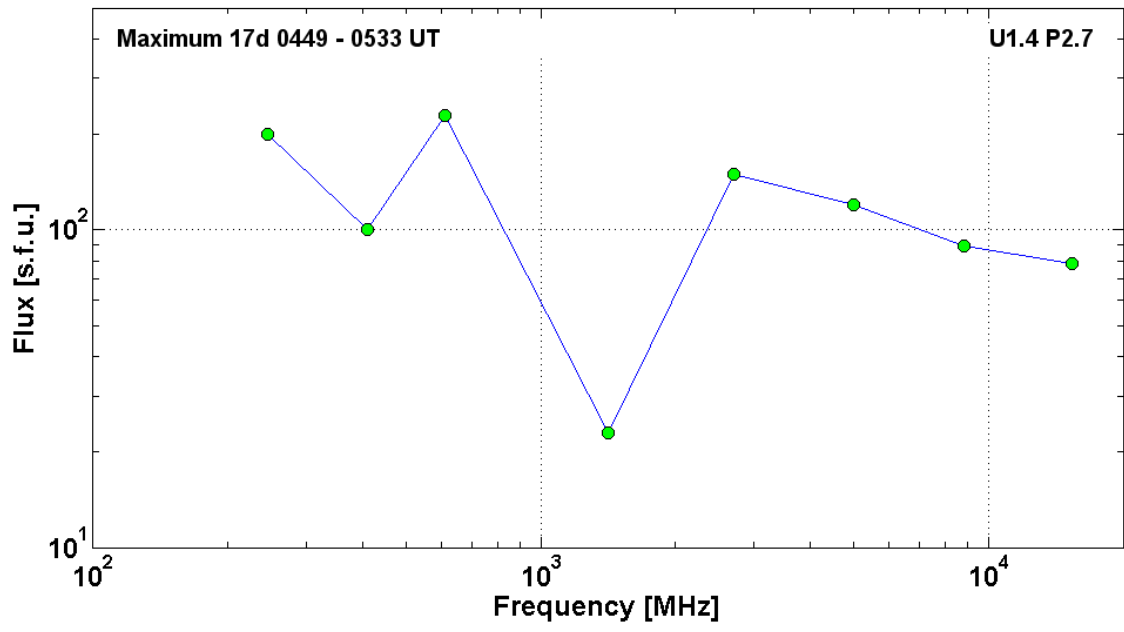
Main X-ray burst 1–8 Å: onset – 17d04^h49^m, max – 17d05^h25^m, Φ = 0.1 J/m²

CME: 05^h30^m, V = 1379 km/s, Δφ = 360°, dA = 058°

▲SC19d18^h15^m

2001 November 17 ● AR9704 To event 408

Hα	6563 Å	0448	0505	0938	S13E42	2N	FZE
1 – 12	keV	0449	0525	0611		M2.8	1.0E-1
53 – 93	keV	<050656	~050706	053910		8	Y
15.4	GHz	0447.0	0533.0	0630.0		1.89	
8.8	GHz	0446.0	0459.0	0614.0		1.95	
5	GHz	0446.0	0459.0	0651.0		2.08	
2.7	GHz	0449.0	0459.0	0653.0	U1.4 P2.7	2.18	
1.4	GHz	0447.0	0449.0	0449.0		1.36	
610	MHz	0512.0	0533.0	0547.0		2.36	
410	MHz	0447.0	0450.0	0454.0		2.00	
245	MHz	0451.0	0455.0	0458.0		2.30	
DS II		0450		0455	45-145	1	
DS II		0500		0507	25-55	3	
DS IV		0444		0555	57-500	1	
DS IV		0455		1025	25-180	2	
DS III	S	0448		0553	57-800	2	
DSF	6563 Å	0404		0435	S10E47	13°	
CME		0530	1379 km/s	-22.5 km/s ²	360°	058°	



PART 2. Event 2001.11.22 – (2001-326)

Particle event: To(Ep>10 MeV) – 22d20^h

Tmax₁(Ep>10 MeV) – 23d10^h, Jmax₁(Ep>10 MeV) – 2.7·10³/cm².s.sr

Tmax₂(Ep>10 MeV) – 24d06^h, Jmax₂(Ep>10 MeV) – 1.1·10⁴/cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax₁ = 390 MeV

– Emax₂ = 350 MeV

Sources: ● solar flare 22d<22^h09^m, 3B/M9.9, S13W38, AR9704

○ solar flare 20^h18^m, M3.8/2B, S26W68, AR9704

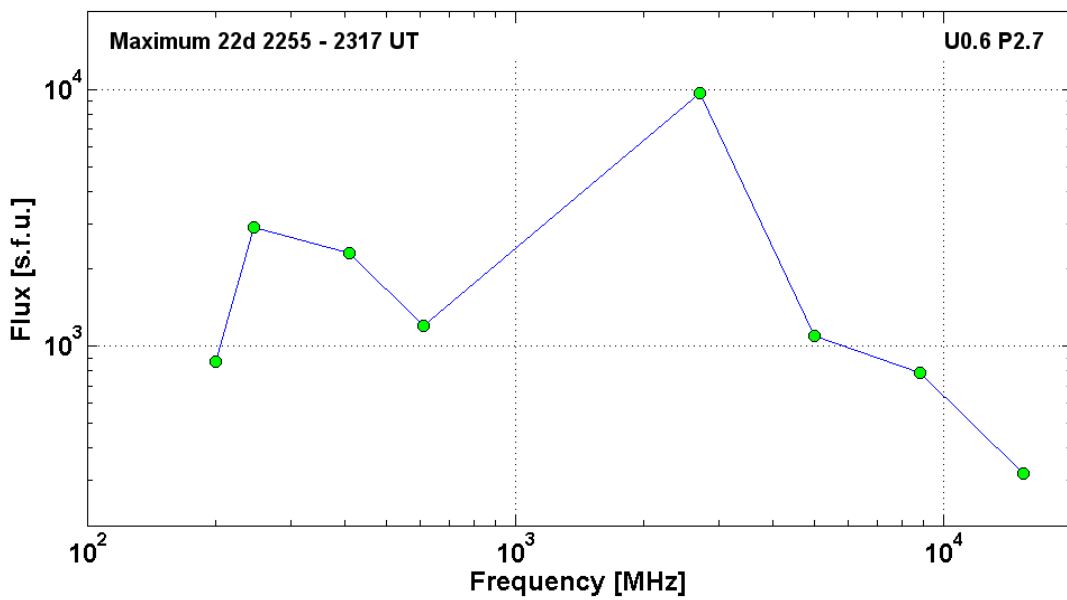
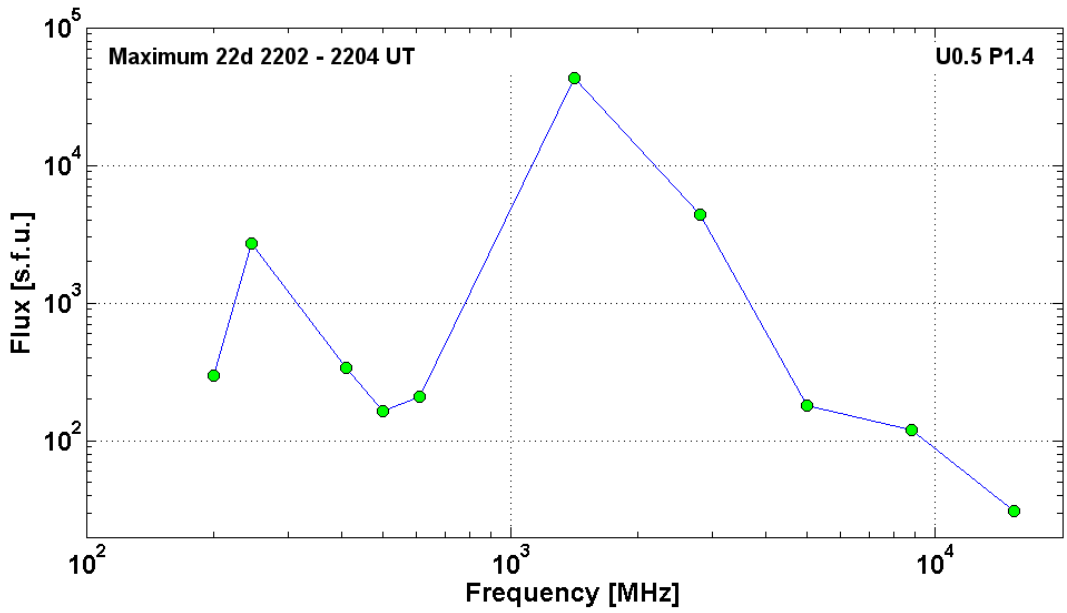
Main X-ray burst 1-8 Å: onset – 22d22^h32^m, max – 22d23^h30^m, Φ = 0.31 J/m²

CME:22d23^h30^m, V = 1437 km/s, Δφ = 360°, dA = 341°

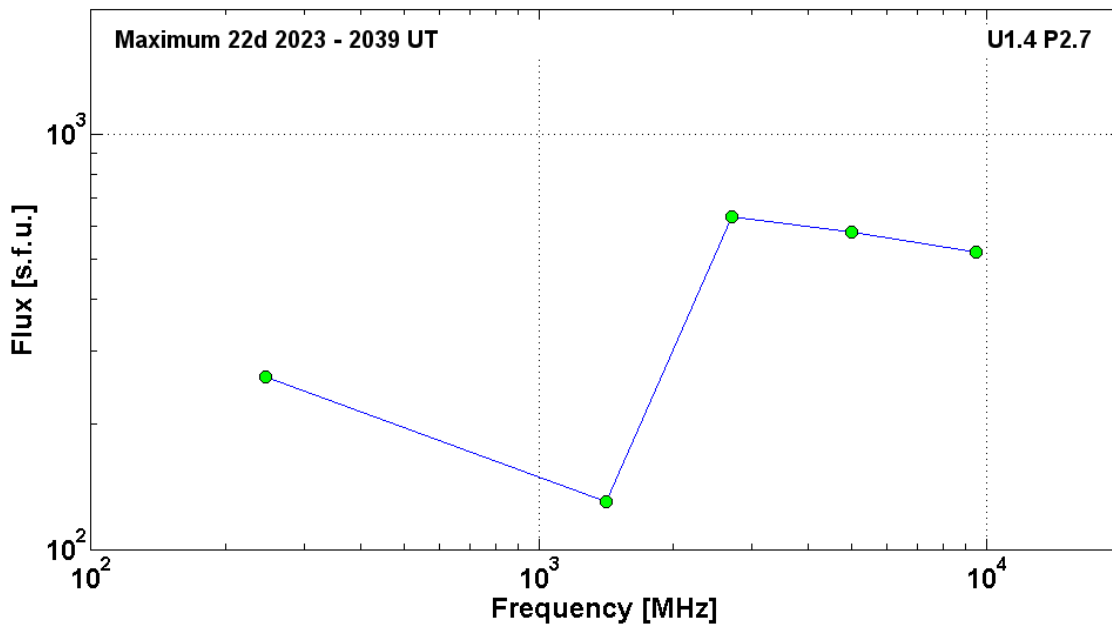
▲SC 24d05^h56^m

2001	November 22	●	AR9704	To event 409			
Hα	6563Å	<2209	2345	0401	S13W38	3B	FHZE
1 – 12	keV	2232	2330	2406		M9.9	3.1E-1
53 – 93	keV	222939	225749	>000351		14	Y
15.4	GHz	2204.0	2204.0	2205.0		1.49	
8.8	GHz	2203.0	2203.0	0000.0		2.08	
5	GHz	2201.0	2203.0	0000.0		2.26	
2.8	GHz	2200.0	2204.0	2209.0		3.64	
1.4	GHz	2158.0	2204.0	0024.0	U0.5 P1.4	4.63	
610	MHz	2201.0	2202.0	2204.0		2.32	
500	MHz	2201.0	2202.0	2203.0		2.22	
410	MHz	2202.0	2202.0	2203.0		2.53	
245	MHz	2201.0	2202.0	2202.0		3.43	
200	MHz	2202.0	2202.0	2203.0		2.48	
DS II		2231		2241	25-116	1	
DS IV		2235		0012	25-180	2	
DS IV	FS	2245		>2400	57-1300	2	
DS III	B	2201		2202	140-700	2	
DS III	N	2253		2346	57-1300	2	
DS CONT		2235		2320	74-180	1	
15.4	GHz	2203.0	2300.0	0024.0		2.51	
8.8	GHz	2202.0	2305.0	0055.0		2.90	
5	GHz	2202.0	2305.0	0055.0		3.04	
2.7	GHz	2159.0	2257.0	0024.0	U0.6 P2.7	3.99	
610	MHz	2201.0	~2255.0	0021.0		3.08	
410	MHz	2201.0	~2257.0	0024.0		3.36	
245	MHz	2201.0	~2315.0	0024.0		3.46	
200	MHz	2232.0	2317.0	2340.0		2.94	

610	MHz	2201.0	2357.0	2358.0		3.54	
410	MHz	2202.0	2355.0	2357.0		3.49	
DS IV	FS	<0000		0010	57-300	1	
DS I	S	0010		0202	60-170	1	
DSF	6563Å	~2048		~1135	S18W36	17°	
CME		2330	1437 km/s	-12.9 km/s ²	360°	349°	



2001	November 22	\emptyset	AR9698		To event 409		
H α	6563 Å	2022	2026	>2126	S26W68	2B	FHZ
1 – 12	keV	2018	2036	2052		M3.8	5.1E-2
53 – 93	keV	<204429	204433	204639		8	Y HXT
9.5	GHz	2022.0	2027.4	2037.5		2.72	
5	GHz	2023.0	2027.0	0000.0		2.76	
2.7	GHz	2023.0	2027.0	2039.0	U1.4 P2.7	2.80	
1.4	GHz	2023.0	2023.0	2037.0		2.11	
245	MHz	2038.0	2039.0	2039.0		2.41	
DS II		2022		2047	25-180	3	
DS III	N	2021		2056	25-180	1	
DS III	G	2023		2026	57-200	3	
DS UNCLF		2038		2044	57-100	3	
CME		2030	1443 km/s	-43.3 km/s ²	360°	221°	



PART 2. Event 2001.12.26 – (2001-360) – GLE-63

Particle event: To(Ep>10 MeV) – 26d05^h

Tmax(Ep>10 MeV) – 26d11^h, Jmax (Ep>10 MeV) – 336/cm².s.sr

Duration of the event – 3 days

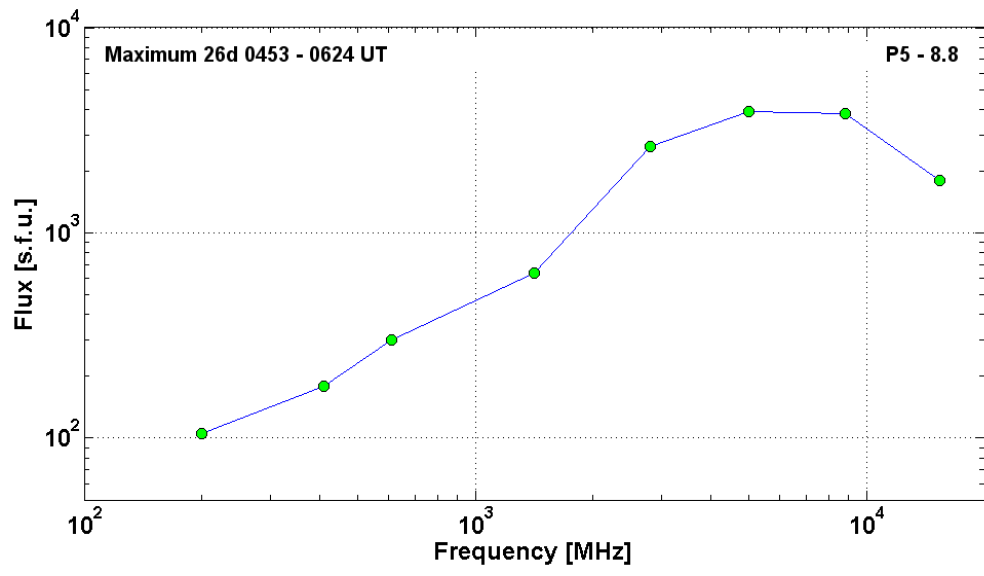
Maximum recorded proton energy of the event – Emax = 1050 MeV

Sources: • solar flare 26d04^h32^m, M7.1/1B, N08W54, AR9742

Main X-ray burst 1–8 Å: onset – 26d04^h32^m, max – 26d05^h40^m, Φ = 0.34 J/m²

CME: 26d05^h30^m, V = 1446 km/s, Δφ = 212°, dA = 266°

2001	December 26	•	AR9742			To event 410	
Hα		0432	0514	0823	N08W54	1B	EPT
1 – 12	keV	0432	0540	0647		M7.1	3.4E-01
15.4	GHz	0453.0	0507.0	0642.0		3.26	
8.8	GHz	0439.0	0512.0	0706.0		3.58	
5	GHz	0435.0	0512.0	0700.0	P5 - 8.8	3.59	
2.8	GHz	0430.0	0514.0	0644.0		3.42	
1.4	GHz	0447.0	0514.0	0648.0		2.81	
610	MHz	0501.0	0624.0	0644.0		2.48	
410	MHz	0455.0	0557.0	0643.0		2.26	
200	MHz	0446.0	0453.0	0659.0		2.02	
DS II		0502		0519	25-180	3	
DS IV		0501		>0810	57-1000	2	
DS IV		0520		1049	25-180	3	
DS I	N	<0652		~1200	60-270	2	
DS III	GG	0455		0511	57-250	2	
DS III		0557		0557	25-72	3	
CME		0530	1446 km/s	-39.9 km/s ²	212°	266°	



PART 2. Event 2001.12.29 – (2001-363)

Particle event: To($E_p > 10$ MeV) – 29d05^h

Tmax($E_p > 10$ MeV) – 29d08^h, Jmax ($E_p > 10$ MeV) – 40/cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 195 MeV

Sources: ■ solar flare 28d20^h02^m, X3.4/..., s26e90*, AR9767 1d behind E-limb

∅ solar flare 29d09^h38^m, M9.3/SF, S08W88, AR9748

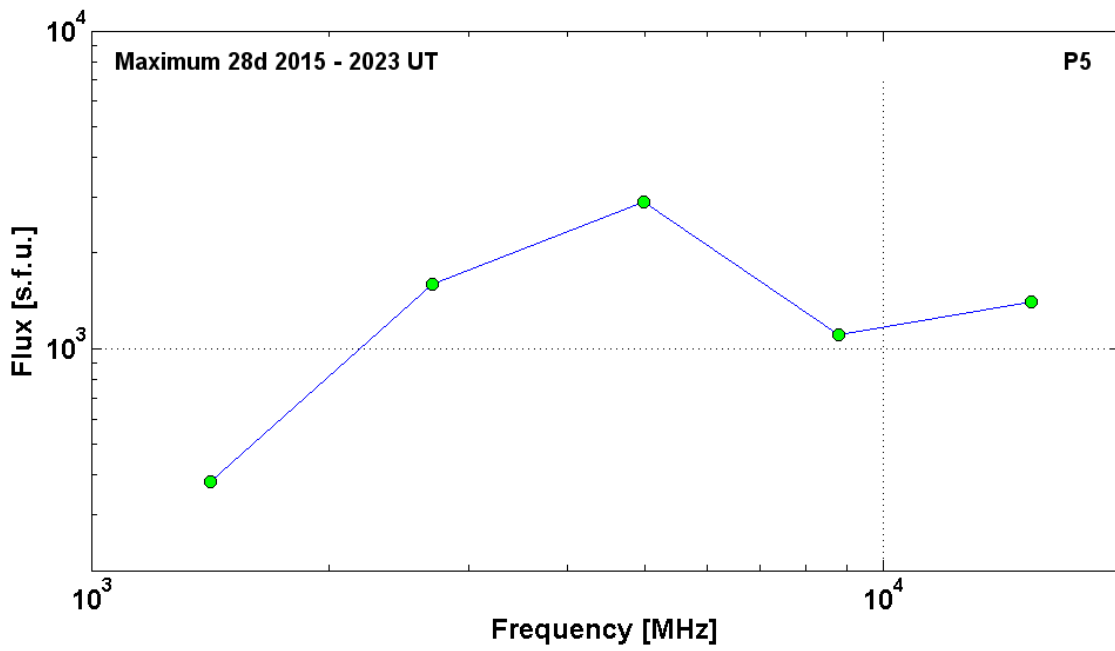
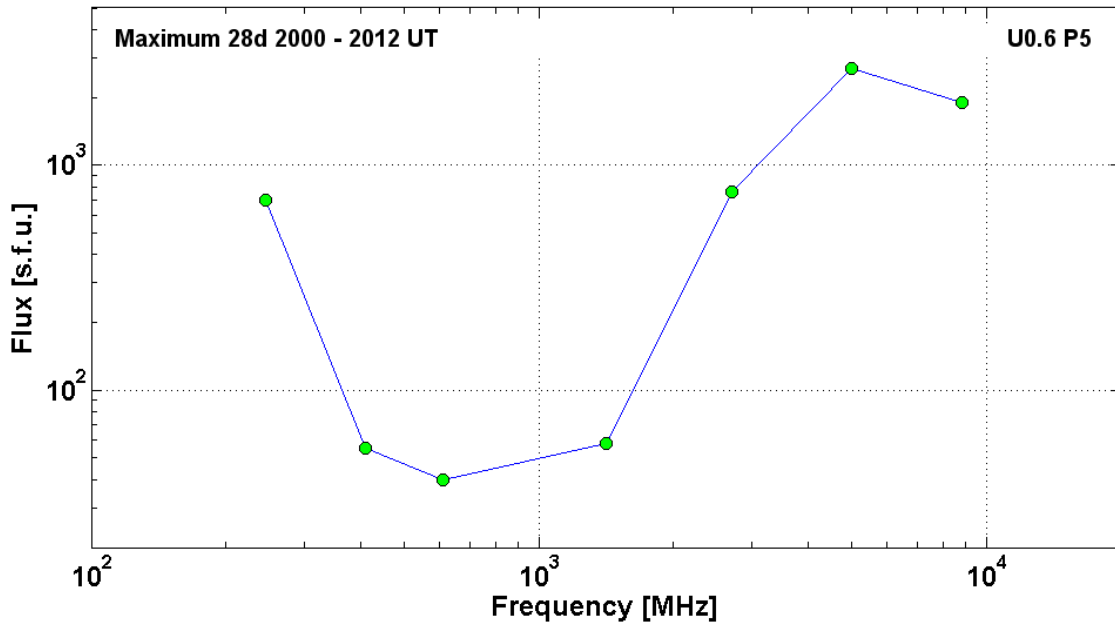
Main X-ray burst 1-8 Å: onset – 28d20^h02^m, max – 28d20^h45^m, Φ = 1.3 J/m²

CME: 28d20^h30^m, V=2216 km/s, Δφ = 360°, dA = 115°;

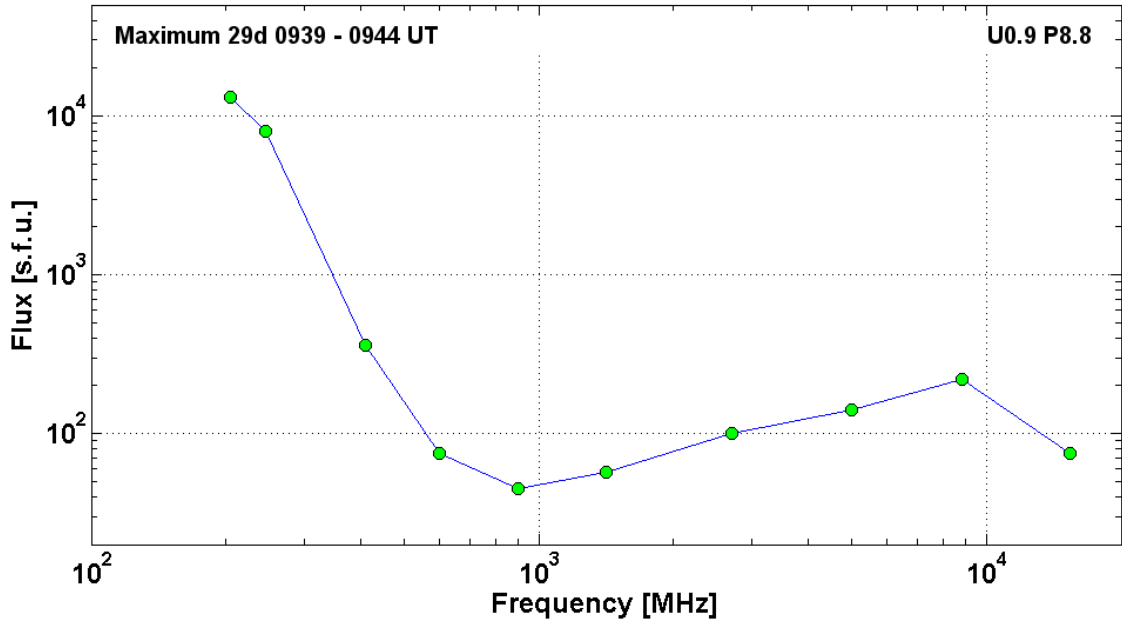
▲ SC 29d05^h38^m

* – probable localization of the flare event

2001	December 28	■			AR9767	To event 411	
Hα	6563 Å	No Flare			s26e90		
1 – 12	keV	2002	2045	2132		X3.4	1.3E00
8.8	GHz	1950.0	2004.0	2021.0		3.28	
5	GHz	1946.0	2004.0	2024.0	U0.6 P5	3.43	
2.7	GHz	1942.0	2005.0	2024.0		2.88	
1.4	GHz	2011.0	2012.0	2015.0		1.76	
610	MHz	2004.0	2006.0	2007.0		1.60	
410	MHz	2003.0	2003.0	~2003.0		1.74	
245	MHz	1959.0	2000.0	2000.0		2.85	
DS II		2003		2006	25-180	2	
DS III	GG	2005		2014	57-130	3	
DS III	N	2007		2040	25-180	2	
15.4	GHz	1944.0	2017.0	2105.0		3.15	
8.8	GHz	1957.0	2015.0	2033.0		3.04	
5	GHz	1949.0	2015.0	2105.0	P5	3.46	
2.7	GHz	1946.0	2015.0	2054.0		3.20	
1.4	GHz	1949.0	2023.0	2045.0		2.58	
DS II	SH	2018		2037	57-130	3	
DS III	GG	2015		2019	57-110	3	
CME		2030	2216 km/s	6.9 km/s ²	360°	115°	



2001	December 29	Ø		AR9748	To event 411		
H α	6563 Å	0941	0942	0952	S08W88	SF	
1 – 12	keV	0938	0945	1006		M9.3	1.1E-1
15.4	GHz	0939.0	0939.0	0945.0		1.88	
8.8	GHz	0939.0	0943.0	0951.0	U0.9 P8.8	2.34	
5	GHz	0939.0	0941.0	0951.0		2.15	
2.7	GHz	0939.0	0939.0	0943.0		2.00	
1.4	GHz	0939.0	0940.0	0943.0		1.76	
900	MHz	0939.3	0942.3			1.65	
600	MHz	0939.2	0942.0			1.88	
410	MHz	0940.0	0942.0	0948.0		2.56	
245	MHz	0939.0	0944.0	0946.0		3.90	
204	MHz	0943.2	0944.2	0947.5		4.11	
DS II		0943		1015	40-280	3	
DS IV		0939		1020	40-450	2	
DS III		0939		0943	25-180	3	
DS III	GG	0943		0949	40-270	2	
DS III	N	0950		0957	30-155	2	
DS V	G	0939		0940	45-165	2	
DS DCIM	G	0939		0944	2000-4500	1	
DS DCIM	GG	0939		0945	800-2000	1	
DS III/V	G,U	0939		0942	40-700	3	
CME		0954	0634 km/s	-10.8 km/s ²	150°	271°	



PART 2. Event 2001.12.30 – (2001-364)

Particle event: To(Ep>10 MeV) – 30d20^h

Tmax₁(Ep>10 MeV) – 31d02^h, Jmax₁(Ep>10 MeV) – 25.5 /cm².s.sr

Tmax₂(Ep>10 MeV) – 31d16^h, Jmax₂(Ep>10 MeV) – 75 /cm².s.sr

Duration of the event – 10 days

Maximum recorded proton energy of the event – Emax₁ = 190 MeV

– Emax₂ = 170 MeV

Sources: ☐ solar flare 29d22^h49^m, 1F/M2.8, S24E88, AR9767

∅ solar flare 30d21^h53^m, C4.2/1F, S24E77, AR9767

Main X-ray burst 1-8 Å: onset – 29d19^h50^m, max – 29d21^h27^m, Φ = 0.19 J/m²

CME: 29d20^h30^m, V=0819 km/s, Δφ = 211°; dA = 281°;

▲ SC 30d20^h29^m

2001	December 29		☐	AR9767		To event 412	
Hα	6563 Å	2249	~2301	>2308	S24E88	1F	
1 – 12	keV	2251	2256	2308		M2.8	2.6E-02
CME		2330	0328 km/s	6.9 km/s ²	360°	115°	

2001	December 30		∅	AR9767		To event 412	
Hα		2155	2158	2203	S24E77	1F	F
1 – 12	keV	2153	2157	2201		C4.2	1.8E-03
410	MHz	2007.0	2009.0	2010.0		2.30	
DS I	S	2013		2228	70-170	1	
DS III	G	2140		2148	57-180	1	
DS CONT		2158		0538	78-180	1	
CME		2330	0360 km/s	-10.2 km/s ²	360°	196°	

PART 2: Event 2002.01.10 – (2002-010)

Particle event: To(Ep>10MeV) – 10d02^h

Tmax(Ep>10MeV) – 11d01^h, Jmax(Ep>10MeV) – 70/cm².s.sr

Duration of the event – 3 days

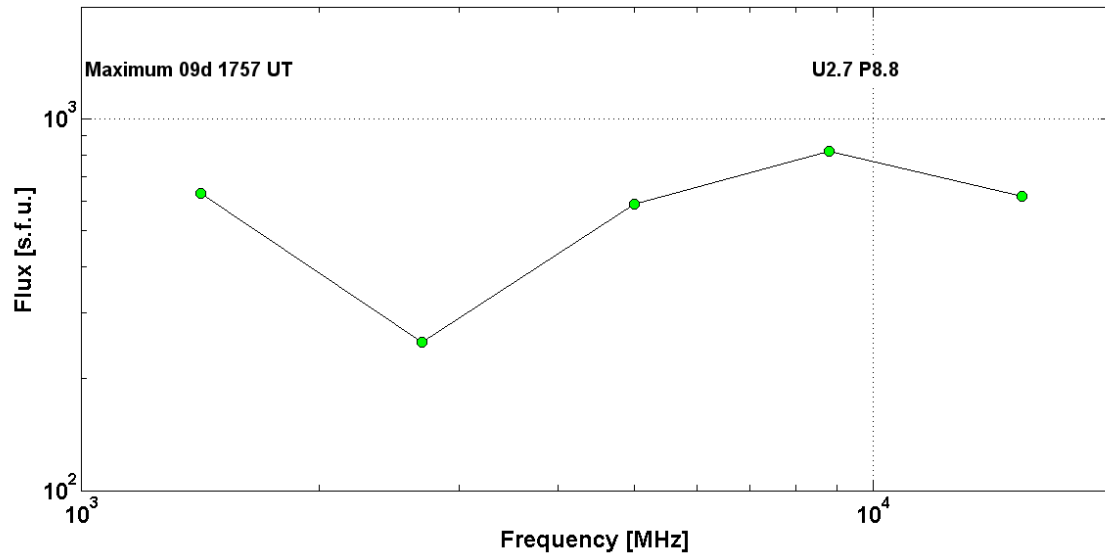
Maximum recorded proton energy of the event – Emax = 85 MeV

Sources: ☉ solar flare 09d17^h42^m, M9.5/2B, N13W02, AR9773

Main X-ray burst 1-8 Å: onset – 09d17^h42^m, max – 09d18^h01^m, Φ = 0.091 J/m²

CME: 09d18^h54^m, V = 0113 km/s, Δφ = 026°, dA = 353°

2002	January 09	☉			AR9773	To event 413	
Hα		1744	1800	1900	N13W02	2B	FU
1 – 12	keV	1742	1801	1812		M9.5	9.1E-02
15.4	GHz	1757.0	1757.0	1758.0		2.79	
8.8	GHz	1751.0	1757.0	0000.0	U2.7 P8.8	2.91	
5	GHz	1751.0	1757.0	0000.0		2.77	
2.7	GHz	1753.0	1757.0	0000.0		2.40	
1.4	GHz	1751.0	1757.0	1759.0		2.80	
DS III		1805		1806	25-90	1	
CME		1854	0113 km/s	2.3 km/s ²	026°	353°	



PART 2. Event 2002.01.15 – (2002-015)

Particle event: To(Ep>10 MeV) – 15d07^h

Tmax(Ep>10 MeV) – 15d18^h, Jmax(Ep>10 MeV) – 7.5 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax = 85 MeV

Sources: ☐ solar flare 14d05^h29^m, M4.4/..., s23w90*, AR9767, 1.5d behind W-limb

∅ solar flare 14d01^h48^m, 2N/M1.7, N05E44, AR9782

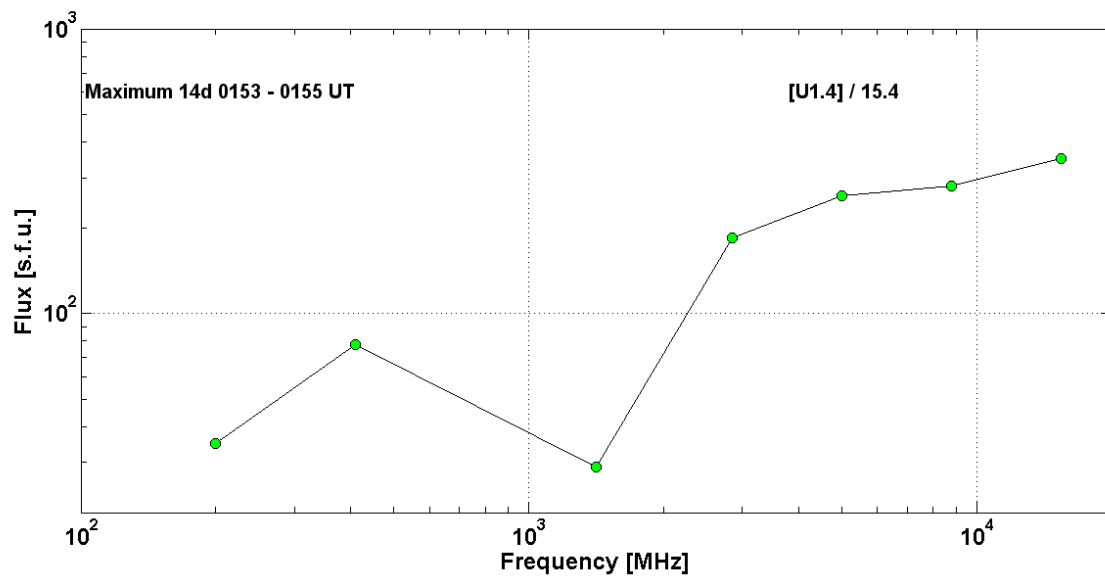
Main X-ray burst 1-8 Å: onset – 14d05^h29^m, max – 14d06^h27^m, Φ = 0.34 J/m²

CME: 14d05^h35^m, V = 1492 km/s, Δφ = 360°, dA = 246°

* – probable localization of the flare event

2002	January 14	☐			AR9767	To event 414	
Hα	6563 Å	No Flare			s23w90		
1 – 12	keV	0529	0627	0825		M4.4	3.4E-01
610	MHz	0555.0	0555.0	~0555.0		1.82	
500	MHz	0518.0	0521.0	0532.0		1.70	
245	MHz	0537.0	0540.0	0540.0		1.85	
200	MHz	0524.0	0535.0	0548.0		1.90	
DS II	SH	0608		0611	85-180	1	
DS III	N	0536		0643	30-170	1	
CME		0535	1492km/s	52.3km/s ²	360°	246°	

2002	January 14	∅			AR9782	To event 414	
Hα		0148	0155	0320	N05E44	2N	FH
1 – 12	keV	0152	0156	0203		M1.7	8.4E-03
15.4	GHz	0154.0	0155.0	0158.0	[U1.4] / 15.4	2.54	
8.8	GHz	0153.0	0155.0	0158.0		2.45	
5	GHz	0153.0	0155.0	0159.0		2.41	
2.8	GHz	0151.0	0155.4	0210.0		2.27	
1.4	GHz	0155.0	0155.0	~0155.0		1.46	
410	MHz	0153.0	0153.0	~0153.0		1.89	
200	MHz	0153.0	0153.0	0154.0		1.54	
CME							gap



PART 2. Event 2002.02.20 – (2002-051)

Particle event: To(Ep>10 MeV) – 20d06^h

Tmax(Ep>10 MeV) – 20d07^h, Jmax (Ep>10 MeV) – 3.3 /cm².s.sr

Duration of the event – 2 days

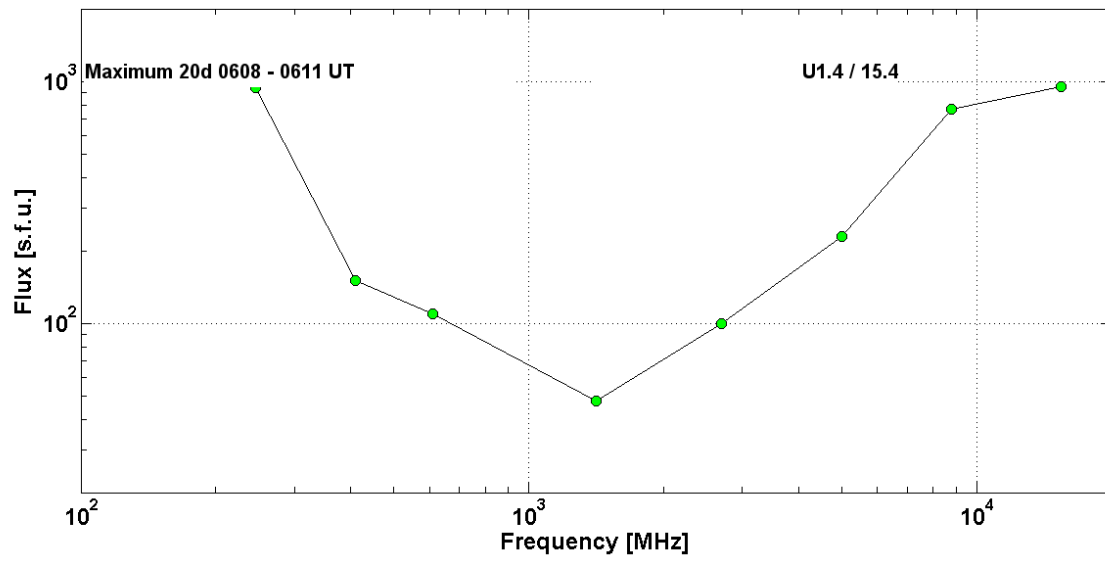
Maximum recorded proton energy of the event – Emax = 150 MeV

Sources: • solar flare 20d05^h52^m, M5.1/1N, N12W72, AR9825

Main X-ray burst 1-8 Å: onset – 20d05^h52^m, max – 20d06^h12^m, Φ = 0.022 J/m²

CME: 20d06^h30^m, V=952 km/s, Δφ = 360°, dA = 263°

2002	February 20	•				AR9825	To event 415	
Hα	6563 Å	0555	0611	0628	N12W72	1N	EF	
1 – 12	keV	0552	0612	0616		M5.1	2.2E-2	
12 – 25	keV	061624	061630	062912		984336	HESSI	
4–7	MeV						CORONAS	
15.4	GHz	0608.0	0611.0	0613.0	U1.4/15.4	2.98		
8.8	GHz	0608.0	0609.0	0612.0		2.89		
5	GHz	0608.0	0609.0	0611.0		2.36		
2.7	GHz	0606.0	0610.0	0611.0		2.00		
1.4	GHz	0608.0	0611.0	0613.0		1.68		
610	MHz	0609.0	0610.0	0611.0		2.04		
410	MHz	0608.0	0610.0	0611.0		2.18		
245	MHz	0608.0	0608.0	0610.0		2.97		
DS II	SH	0615		0630	57-190	2		
DS II		0620		0625	25-57	1		
DS IV		0621		0637	25-71	1		
DS III	G	0555		0558	25-800	3		
DS III	G	0608		0615	25-1000	3		
DS V		0555		0558	25-180	3		
DS V		0608		0610	25-180	1		
n°							Armenia(S)	
CME		0630	0952 km/s	-17.1 km/s ²	360°	263°		



PART 2. Event 2002.03.16 – (2002-075)

Particle event: To(Ep>10 MeV) – 16d02^h

Tmax₁(Ep>10 MeV) – 16d13^h, Jmax₁(Ep>10 MeV) – 1.3 /cm².s.sr

Tmax₂(Ep>10 MeV) – 17d11^h, Jmax₂(Ep>10 MeV) – 1.1 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 75 MeV

– Emax₂ = 70 MeV

Sources: ● solar flare 15d22^h00^m, M2.2/1F, S08W03, AR9866

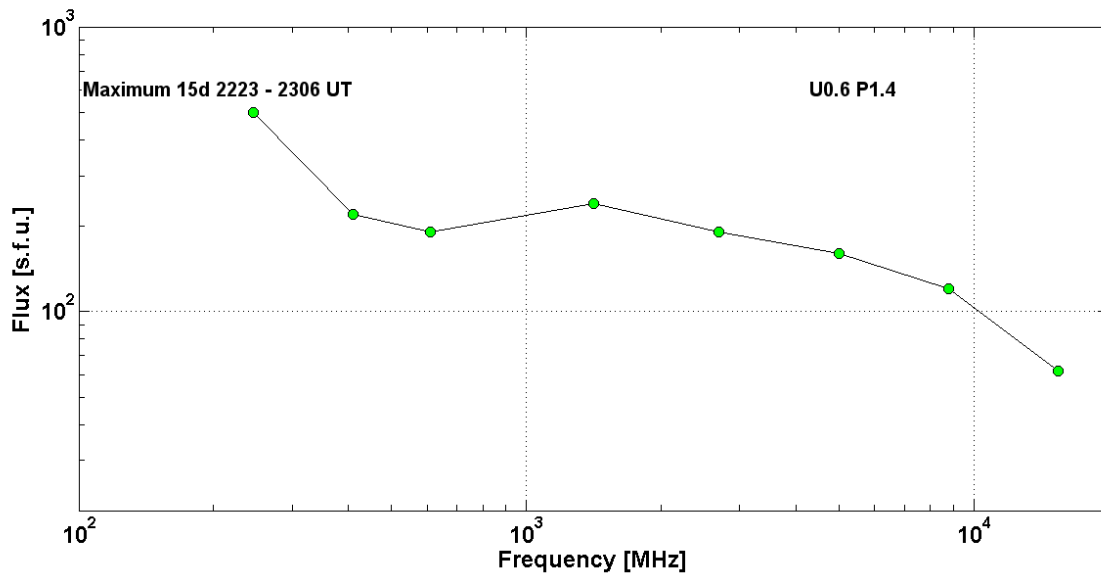
∅ solar flare 17d10^h11^m, M1.3/..., s20e22*, AR9871

Main X-ray burst 1–8 Å: onset – 15d22^h09^m, max – 15d23^h10^m, Φ = 0.13 J/m²

CME: 15d23^h06^m, V=957 km/s, Δφ = 360°; dA = 309°

* – probable localization of the flare event

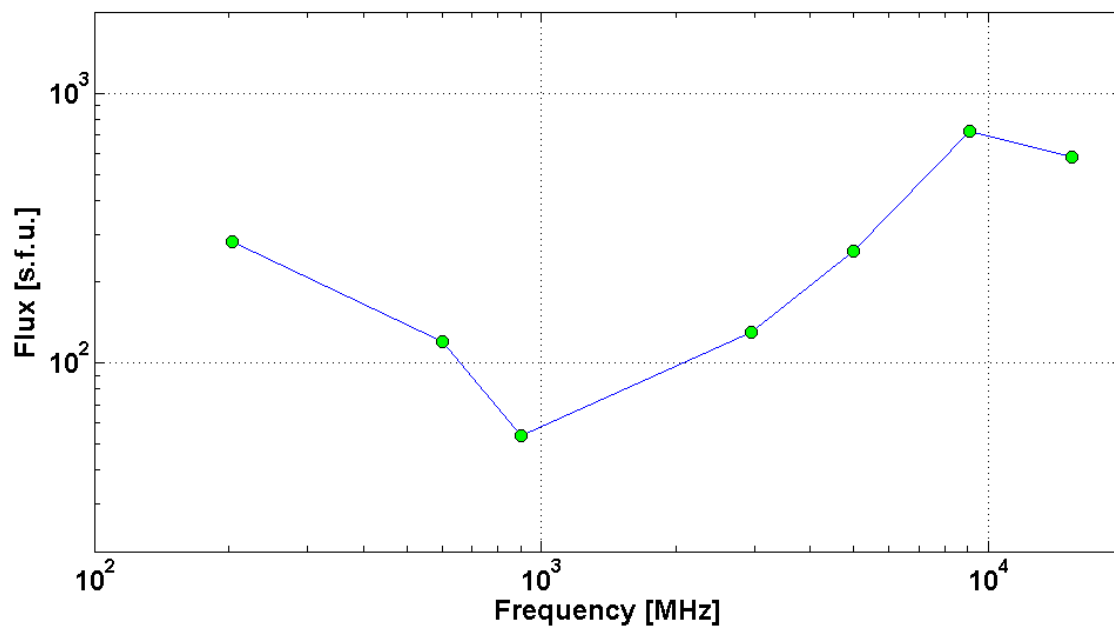
2002	March 15	●			AR9866	To event 416	
Hα	6563 Å	2220	2238	0041	S08W03	1F	FZ
1 – 12	keV	2209	2310	0042		M2.2	1.3E-01
25-50	keV	221856	224614	224700		4869744	HESSI
12-25	keV	23:31:20	23:32:42	23:51:00		2764632	HESSI
12-25	keV	23:51:00	23:51:58	00:26:28		2748672	HESSI
6-12	keV	00:26:28	00:26:30	00:34:00		346968	HESSI
15.4	GHz	2223.0	2223.0	~2223.0		1.79	
8.8	GHz	2223.0	2234.0	2304.0		2.08	
5	GHz	2222.0	2234.0	2304.0		2.20	
2.7	GHz	2220.0	2234.0	2303.0		2.28	
1.4	GHz	2220.0	2234.0	2300.0	U0.6 P1.4	2.38	
610	MHz	2220.0	2236.0	2303.0		2.28	
410	MHz	2220.0	2236.0	2306.0		2.34	
245	MHz	2306.0	2306.0	~2306.0		2.70	
DS IV		2213		0045	25-180	1	
DS IV	FS	2218		2312	57-750	1	
DS III	N	2208		0005	25-138	1	
DS III	S,C	<0000		>0800	57-200	2	
DS CONT		2219		0026	25-180	1	
CME		2306	0957 km/s	-17.4 km/s ²	360°	309°	



2002	March 17	Ø			AR9871	To event 416	
H α	6563 Å	No Flare Patrol			s20e22		
1 – 12	keV	1011	1011	1024		M1.3	6.0E-03
50-100	keV	100840	101742	102112			HESSI
15.4	GHz	1014.0	1015.0	1022.0		2.76	
9.1	GHz	1013.0	1015.9	1030.0		2.86	
5	GHz	1014.0	1015.0	1022.0		2.41	
3	GHz	1012.9	1016.3			2.11	
900	MHz	1008.4	1014.7			1.73	
600	MHz	1008.4	1013.7	1032.3	U0.9 P9.1	2.08	
204	MHz	1013.8	1015.9	1016.8		2.45	
DS I	S,N	~1023		~1050	200-300	2	
DS III	GG,C	1008		1016	100-300	3	
DS III	G	1008		1009	110-400	2	
DS III	GG	1013		1023	40-350	3	
DS III	G	1035		1036	40-250	2	
DS III	G	1039		1039	40-300	1	
DS DCIM	P	1008		1036	300-4000	3	
CME		1034	0989 km/s	-6.2km/s ²	187°	165°	

Maximum 17d 1013 - 1016 UT

U0.9 P9.1



PART 2. Event 2002.03.18 – (2002-077)

Particle event: To(Ep>10 MeV) – 18d00^h

Tmax₁(Ep>10 MeV) – 18d15^h, Jmax₁(Ep>10 MeV) – 14.5 /cm².s.sr

Tmax₂(Ep>10 MeV) – 19d06^h, Jmax₂(Ep>10 MeV) – 20 /cm².s.sr

Duration of the event – 2days

Maximum recorded proton energy of the event – Emax₁ = 160 MeV

– Emax₂ = 150 MeV

Sources: ☉ solar flare 17d19^h24^m, M4.0/SF, S22E16, AR9871

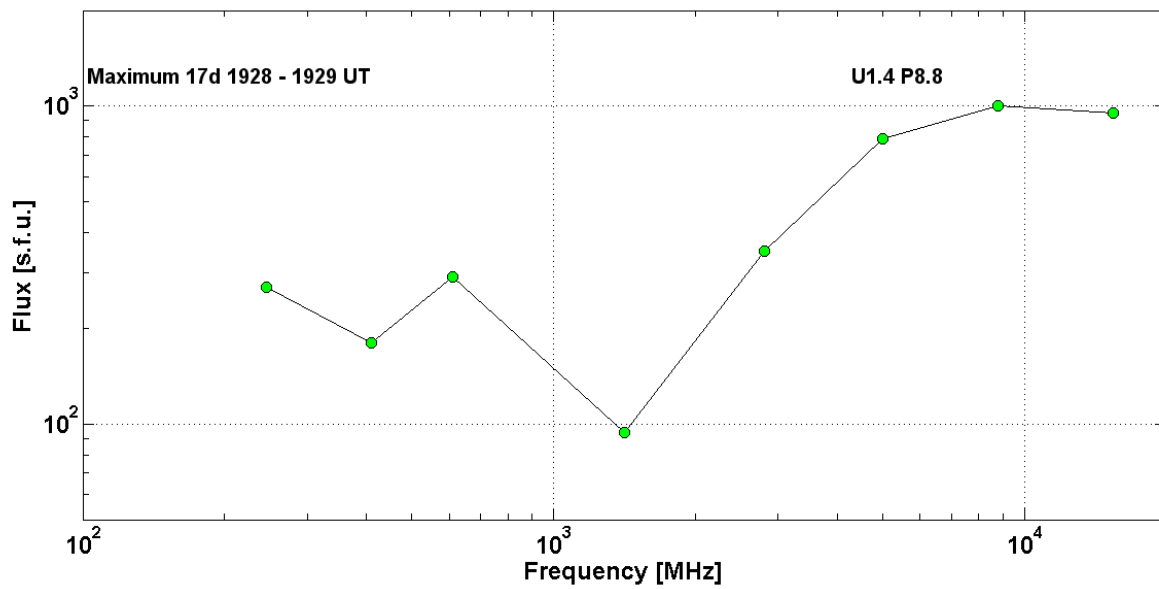
∅ solar flare 18d02^h16^m, M1.0/SN, S16E27, AR9871

Main X-ray burst 1-8 Å: onset – 17d19^h24^m, max – 17d19^h31^m, Φ = 0.011 J/m²

CME: 17d20^h06^m, V = 823 km/s, Δφ = 288°, dA = 276°

▲ SC 18d13^h23^m;

2002	March 17	☉		AR9871		To event 417	
Hα	6563 Å	<1938	~1938	1948	S22E16	SF	
1 – 12	keV	1924	1931	1934		M4.0	1.1E-2
50-100	keV	192616	193014	193628		6799464	HESSI
15.4	GHz	1927.0	1928.0	1934.0		2.98	
8.8	GHz	1926.0	1928.0	1934.0	U1.4 P8.8	3.00	
5	GHz	1927.0	1928.0	1935.0		2.90	
2.8	GHz	1923.0	1929.0	~1933.0		2.54	
1.4	GHz	1927.0	1928.0	1934.0		1.97	
610	MHz	1928.0	1928.0	1929.0		2.46	
410	MHz	1928.0	1929.0	1929.0		2.26	
245	MHz	1927.0	1928.0	1934.0		2.43	
DS III	N	1926		2112	25-180	3	
DS V		1926		1931	25-180	2	
n°							Armenia(S)
CME		2006	0823 km/s	-7.0 km/s ²	153°	191°	



2002	January 18	Ø			AR9871	To event 417	
H α	6563 Å	0222	0224	0233	S16E27	SN	E
1 – 12	keV	0216	0231	0400		M1.0	4.5E-02
6-12	keV	025912	030014	030436		60024	HESSI
6-12	keV	030436	030506	032248		166440	HESSI
CME		0254	0989 km/s	-7.0 km/s ²	360°	311°	

PART 2. Event 2002.03.20 – (2002-079)

Particle event: To(Ep>10 MeV) – 20d13^h

Tmax(Ep>10 MeV) – 20d17^h, Jmax (Ep>10 MeV) – 8 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 60 MeV

Sources: o solar flare 20d08^h08^m, C1.9/SF, S19W41, AR9873

Main X-ray burst 1–8 Å: onset – 20d08^h08^m, max – 20d08^h33^m, Φ = 0.0031 J/m²

▲ SC 20d13^h28^m

2002	March 20	o			AR9873	To event 418	
Hα	6563 Å	0823	0824	0827	S19W41	SF	
1 – 12	keV	0808	0833	0845		C1.9	3.1E-3
245	MHz	0808.0	0808.0	~0808.0		2.40	
DS III	GG	0808		0808	30-270	2	
245	MHz	0837.0	0838.0	0838.0		2.63	
DS III	G	0837		0838	30-270	2	

PART 2. Event 2002.03.22 – (2002-081)

Particle event: To(Ep>10 MeV) – 22d12^h

Tmax₁(Ep>10 MeV) – 22d20^h, Jmax₁(Ep>10 MeV) – 1 /cm².s.sr

Tmax₂(Ep>10 MeV) – 23d13^h, Jmax₂(Ep>10 MeV) – 9 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax₁ = 45 MeV

– Emax₂ = 50 MeV

Sources: ■ solar flare 22d10^h12^m, M1.6/..., s10w90, AR9866

Main X-ray burst 1-8 Å: onset – 22d10^h12^m, max – 22d11^h14^m, Φ = 0.049 J/m²

CME: 22d11^h06^m, V = 1750 km/s, Δφ = 360°, dA = 259°

▲ SC 23d11^h37^m

* – probable localization of the flare event

2002	March 22	■			AR9866	To event 419	
Hα	6563 Å	No Flare Patrol			s10w90		
1 – 12	keV	1012	1114	1152		M1.6	4.9E-2
6-12	keV	1037	103730	103828		9600	HESSI
25-50	keV	104536	105838	105940		663384	HESSI
6-12	keV	113208	113250	113912		99912	HESSI
3	GHz	1047.5	~1100.0	1152.5		1.77	
204	MHz	1010.7	1010.9	1013.2		1.86	
DS II		1047		1049	40-220	2	
DS IV		1052		~1154	40-200	2	
DS I	GG	1048		1049	130-160	2	
DS III	G	1047		1048	40-210	2	
DS DCIM	G	1047		1114	2000-4500	1	
CME	1106	1750 km/s	-22.5 km/s ²	360°	259°	1106	

PART 2. Event 2002.04.17 – (2002-107)

Particle event: To(Ep>10 MeV) – 17d10^h

Tmax(Ep>10 MeV) – 17d16^h, Jmax (Ep>10 MeV) – 21 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 125 MeV

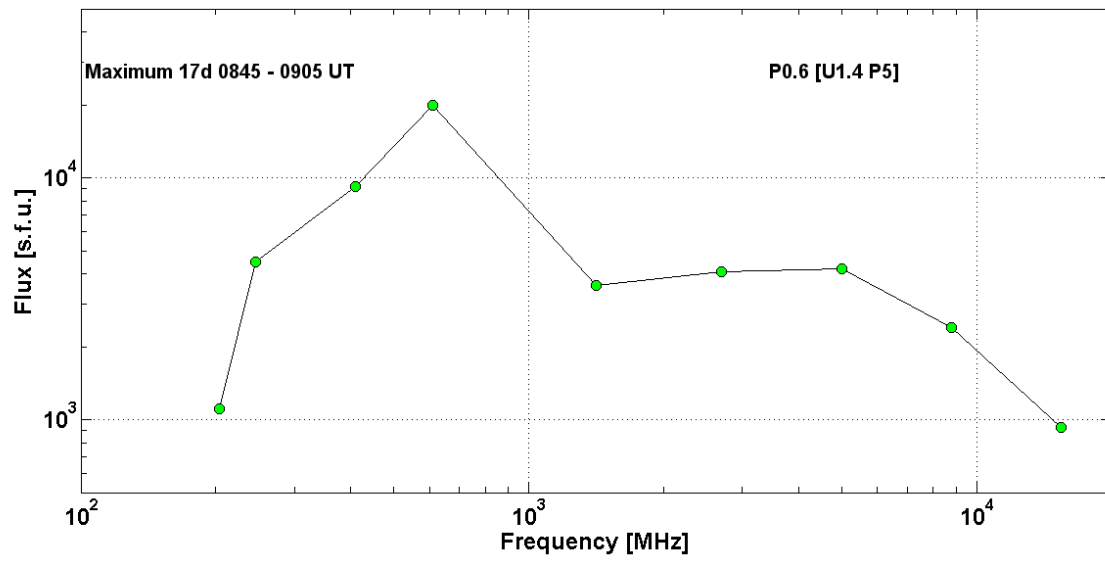
Sources: ● solar flare 17d07^h46^m, M2.6/2N, S14W36, AR9906

Main X-ray burst 1–8 Å: onset – 17d07^h46^m, max – 17d08^h24^m, Φ = 0.15 J/m²

CME: 17d08^h26^m, V = 1240 km/s, Δφ = 360°, dA = 292°

▲ SC 17d11^h09^m; ▲ SC 19d08^h36^m;

2002	April 17	●	AR9906	To event 420			
Hα	6563 Å	0750	0815	>1141	S14W36	2N	FTZ
1 – 12	keV	0746	0824	0957		M2.6	1.5E-1
25-50	keV	081432	081438	081624		1125888	HESSI
15.4	GHz	0803.0	0857.0	1033.0		2.97	
8.8	GHz	0753.0	0857.0	1012.0		3.38	
5	GHz	0753.0	0857.0	1037.0	P0.6 [U1.4 P5]	3.62	
2.7	GHz	0746.0	0857.0	0000.0		3.61	
1.4	GHz	0751.0	0847.0	1045.0		3.56	
610	MHz	0753.0	0905.0	1041.0		4.30	
410	MHz	0757.0	0845.0	0953.0		3.96	
245	MHz	0801.0	0901.0	1041.0		3.65	
204	MHz	0832.0	0905.5	1056.1		3.05	
DS II		0754		0820	100-600	3	
DS II		0808		0823	25-79	2	
DS II		0845		0908	100-1400	3	
DS II		0945		1024	100-900	3	
DS IV		0756		~1100	40-800	3	
DS III	GG,RS	0749		0758	720-3300	3	
DS III	N	0826		1200	25-270	2	
DS CONT		0804		~0832	25-270	2	
DS CONT		~0840		~1032	25-270	2	
DS DCIM	P,C,S	0754		1052	150-4000	3	
DS UNCLF		0813		0816	25-70	2	
CME		0826	1240 km/s	-19.8 km/s ²	360°	292°	



PART 2. Event 2002.04.19 – (2002-109)

Particle event: To(Ep>10 MeV) – 19d05^h

Tmax₁(Ep>10 MeV) – 19d09^h, Jmax₁(Ep>10 MeV) – 1 /cm².s.sr

Tmax₂(Ep>10 MeV) – 19d19^h, Jmax₂(Ep>10 MeV) – 2.7 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 45 MeV

– Emax₂ = 50 MeV

Sources: ◊ Flare activity AR9906

○ solar flare 19d15^h16^m, C2.5/SF, S16W59, AR9906;

Main X-ray burst 1–8 Å: onset – 19d15^h16^m, max – 19d15^h21^m; Φ = 0.0013 J/m²

▲ SC 19d08^h36^m;

2002	April 19	○			AR9906	To event 421	
Hα	6563 Å	1513	1520	1528	S16W60	SF	F
1 – 12	keV	1516	1521	1527		C2.5	1.4E-3

PART 2. Event 2002.04.21 – (2002-111)

Particle event: To(Ep>10 MeV) – 21d01^h

Tmax₁(Ep>10 MeV) – 21d03^h, Jmax₁(Ep>10 MeV) – 915 /cm².s.sr *)

Tmax₂(Ep>10 MeV) – 21d09^h, Jmax₂(Ep>10 MeV) – 1730 /cm².s.sr *)

Duration of the event – 6 days

Maximum recorded proton energy of the event – Emax₁ = 580 MeV

– Emax₂ = 580 MeV

*) Data from S/C ACE (SIS)

Sources: ■ solar flare 21d00^h43^m, X1.5/1F, S14W84, AR9906

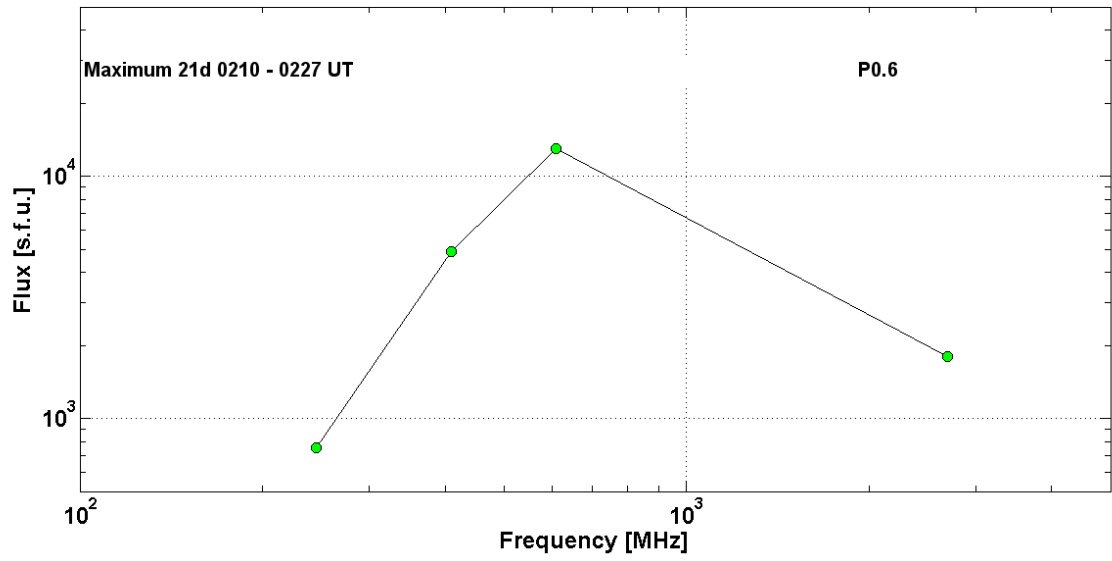
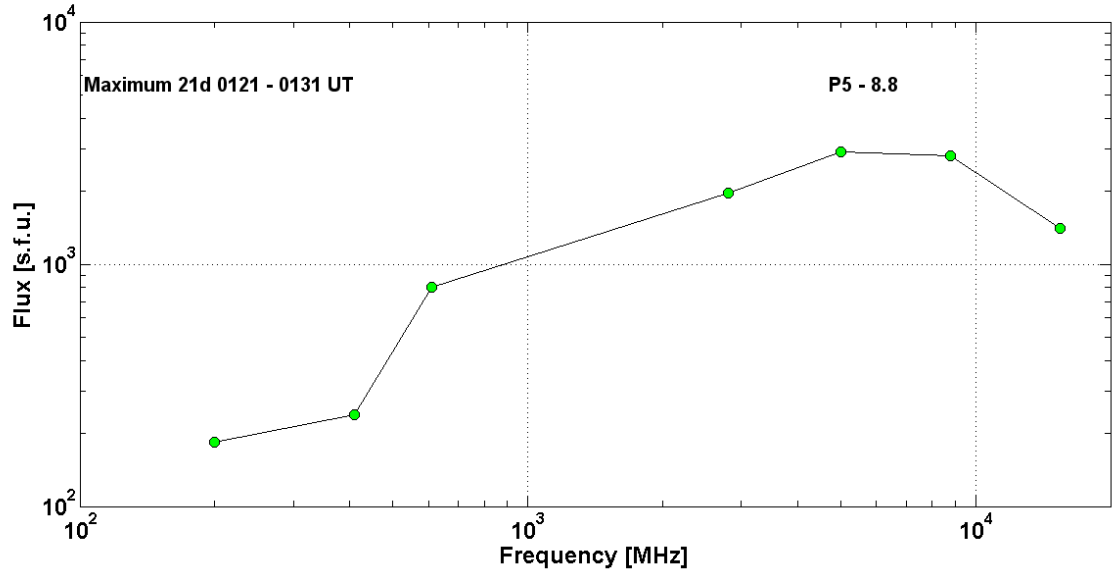
Main X-ray burst 1–8 Å: onset – 21d00^h43^m, max – 21d01^h51^m, Φ = 0.6 J/m²

CME: 21d01^h27^m, V = 2393 km/s, Δφ = 360°, dA = 282°

▲ SC 23d04^h48^m

2002	April 21	■ AR9906				To event 422	
Hα	6563 Å	0059	0131	0251	S14W84	1F	FY
1 – 12	keV	0043	0151	0238		X1.5	6.0E-1
12-25	keV	004008	004914	005116		277345	HESSI
100-300	keV	005116	013202	013324		59430512	HESSI
15.4	GHz	0110.0	0123.0	0252.0		3.15	
8.8	GHz	0058.0	0123.0	0318.0	P5 - 8.8	3.45	
5	GHz	0057.0	0123.0	0321.0		3.46	
2.8	GHz	0044.0	0131.0	0342.0		3.29	
610	MHz	0111.0	0121.0	0000.0		2.90	
410	MHz	0111.0	0121.0	0000.0		2.38	
200	MHz	0102.0	0131.0	0305.0		2.27	
DS II	SH	0119		0130	57-130	3	
DS II		0119		0126	25-80	3	
DS IV		0117		0154	30-220	3	
DS I	S,C	0134		0238	57-120	1	
DS III	S,C	0120		0150	57-240	1	
DS III	G	0130		0132	57-210	2	
DS CONT		0120		0124	300-900	1	
2.7	GHz	0058.0	0227.0	0328.0		3.26	
610	MHz	0145.0	0210.0	0305.0	P0.6	4.11	
410	MHz	0146.0	0220.0	0252.0		3.69	
245	MHz	0143.0	0227.0	0306.0		2.88	
DS IV		0136		0238	25-124	1	
DS IV		0148		0245	130-1800	3	
DS III	G	0210		0222	25-210	2	
^o n						Mauna Kea, Norikura	

CME		0127	2393 km/s	-1.4 km/s ²	360°	282°	
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PART 2. Event 2002.05.22 – (2002-142)

Particle event: To(Ep>10 MeV) – 22d07^h

Tmax₁(Ep>10 MeV) – 23d10^h, Jmax₁(Ep>10 MeV) – 260 /cm².s.sr

Tmax₂(Ep>10 MeV) – 23d16^h, Jmax₂(Ep>10 MeV) – 87 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 150 MeV

– Emax₂ = 110 MeV

Sources: ☉ solar flare 22d03^h18^m, C5.0/SF, S22W53, DSF;

Main X-ray burst 1-8 Å: onset – 22d03^h18^m, max – 22d03^h54^m, Φ = 0.025 J/m²;

CME: 22d03^h50^m, V = 1557 km/s, Δφ = 360°, dA = 250°;

▲ SC 23d10^h51^m

2002	May 22		☉	AR		To event 423	
Hα	6563 Å	<0400	~04001	0437	S22W53	SF	U
1 – 12	keV	0318	0354	0502		C5.0	2.5E-2
6-12	keV	04:00:44	04:00:54	04:16:32		74256	HESSI
2.8	GHz	0323.0	0337.6	0408.0		1.26	
200	MHz	0329.0	0329.0	0330.0		1.54	
DS III	GG	0320		0353	57-180	2	
DS III		0348		0352	25-180	2	
DS CONT		0321		0353	25-180	1	
DSF	6563 Å	21 ^d >1929		22 ^d <1135	S30W34	43°	
CME		0350	1557 km/s	-10.4 km/s ²	360°	250°	

Part 2. Event 2002.07.07 – (2002-188)

Particle event: To(Ep>10 MeV) – 07d13^h

Tmax(Ep>10 MeV) – 07d20^h, Jmax (Ep>10 MeV) –26/cm².s.sr *)

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 85 MeV

*) Data from s/c ACE (SIS)

Sources: ☐ solar flare 07d11^h15^m, M1/..., s13w90*, AR10017, 1.5d behind W-limb

Main X-ray burst 1–8 Å: onset – 07d11^h15^m, max – 07d11^h43^m, Φ = 0.062 J/m²

CME: 07d11^h30^m, V = 1423 km/s, Δφ = 228°, dA = 260°

* – probable localization of the flare event

2002	July 07	☐			AR10017	To event 424	
Hα	6563 Å	No Flare			s13w90		
1 – 12	keV	1115	1143	1317		M1.0	6.2E-2
12-25	keV	112956	113050	113908		339912	HESSI
12-25	keV	113908	113910	114956		83664	HESSI
12-25	keV	121304	121314	121624		56784	HESSI
12-25	keV	121624	121842	123516		247872	HESSI
6-12	keV	123516	123518	123852		35808	HESSI
204	MHz	1112.6	1114.7	1115.1		1.85	
DS I	S,N	~1110		~1145	130-320	1	
DS I	S	1122		1137	45-90	2	
DS III	GG	1111		1119	40-350	2	
DS III	N	1152		1158	45-90	1	
DS III	B	1243		1243	40-65	2	
EPL	6563 Å	1039		1059	S13W90		
CME		1130	1423 km/s	22.0 km/s ²	228°	260°	

PART 2. Event 2002.07.16 – (2002-197)

Particle event: To(Ep>10 MeV) – 16d12^h

Tmax₁(Ep>10 MeV) – 16d22^h, Jmax₁(Ep>10 MeV) – 27 /cm².s.sr

Tmax₂(Ep>10 MeV) – 17d14^h, Jmax₂(Ep>10 MeV) – 85 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 130 MeV

– Emax₂ = 130 MeV

Sources: ● solar flare 15d19^h50^m, 3B/X3.0, N19W01, AR10030*

3B/M1.8, N19W01, AR10030*

∅ solar flare 17d06^h 58^m, M8.5/1B, N20W16 AR10030

Main X-ray burst 1–8 Å: onset –15d19^h59^m, max – 15d20^h08^m, Φ = 0.14 J/m²

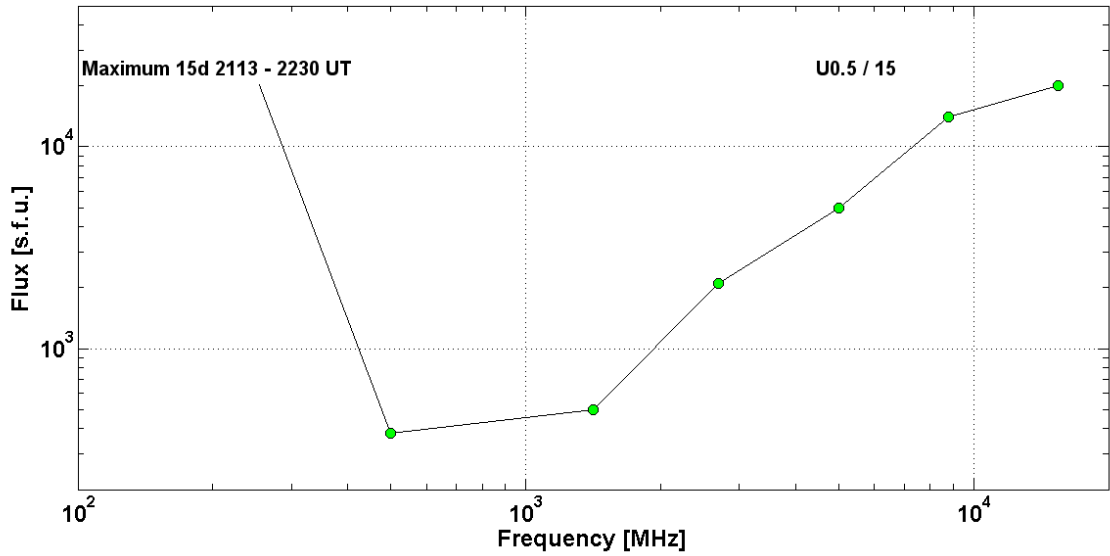
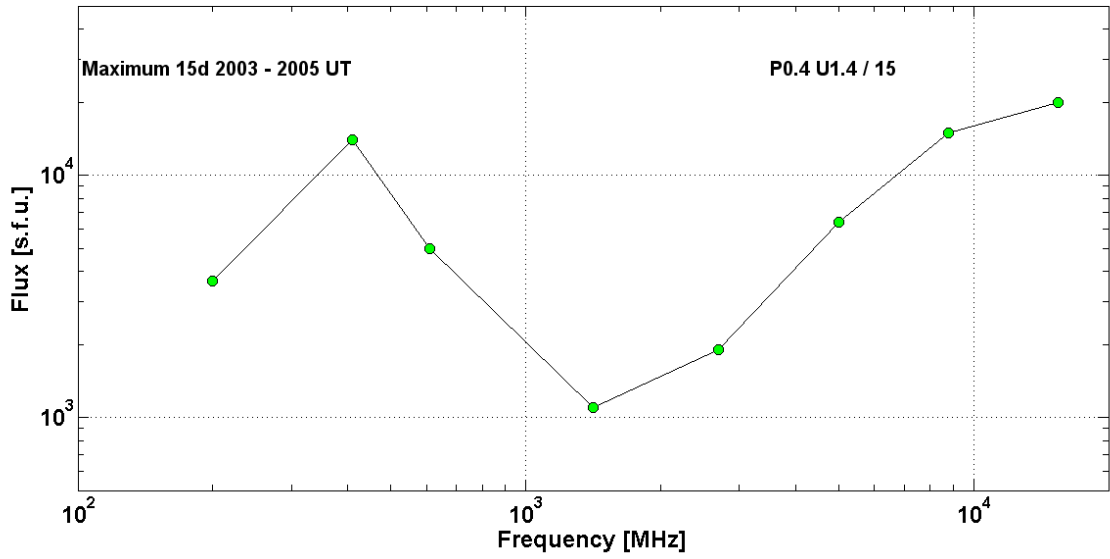
CME: 15d20^h30^m, V = 1151 km/s, Δφ = 360°, dA = 035°

▲SC 17d16^h04^m

* One flare event with two X-ray bursts

2002	July 15	●	AR10030	To event 425			
Hα	6563 Å	1950	2011	>2334	N19W01	3B	FU
1 – 12	keV	1959	2008	2014		X3.0	1.4E-1
1 – 12	keV	2103	2132	2148		M1.8	4.3E-2
25-50	keV	202512	202802	205040		6989876	HESSI
25-50	keV	205040	211414	212740		5761680	HESSI
15.4	GHz	2003.0	2004.0	2156.0	P0.4 U1.4/15	4.30	
8.8	GHz	2001.0	2004.0	2146.0		4.18	
5	GHz	1958.0	2004.0	2204.0		3.81	
2.7	GHz	1957.0	2004.0	2221.0		3.28	
1.4	GHz	2001.0	2004.0	2228.0		3.04	
610	MHz	2003.0	2005.0	2225.0		3.70	
410	MHz	2001.0	2003.0	2304.0		4.15	
200	MHz	2003.0	2004.0	2015.0		3.56	
DS IV		1955		2213	30-80	3	
DS IV		2023		2319	25-180	2	
DS III	G	1954		2030	25-600	3	
15.4	GHz	2002.0	2230.0	2234.0	U0.5/15	4.30	
8.8	GHz	2001.0	2141.0	2234.0		4.15	
5	GHz	1957.0	2142.0	2234.0		3.70	
2.7	GHz	1955.0	2142.0	2234.0		3.32	
1.4	GHz	1956.0	2142.0	2234.0		2.70	
500	MHz	2003.0	2113.0	2148.0		2.58	
245	MHz	2001.0	2129.0	2221.0		4.40	
DS IV	FS	<2110		2214	57-1500	3	
DS III	S,C	2214		>2400	57-180	1	
CME		2030	1151 km/s	-25.6 km/s ²	360°	035°	

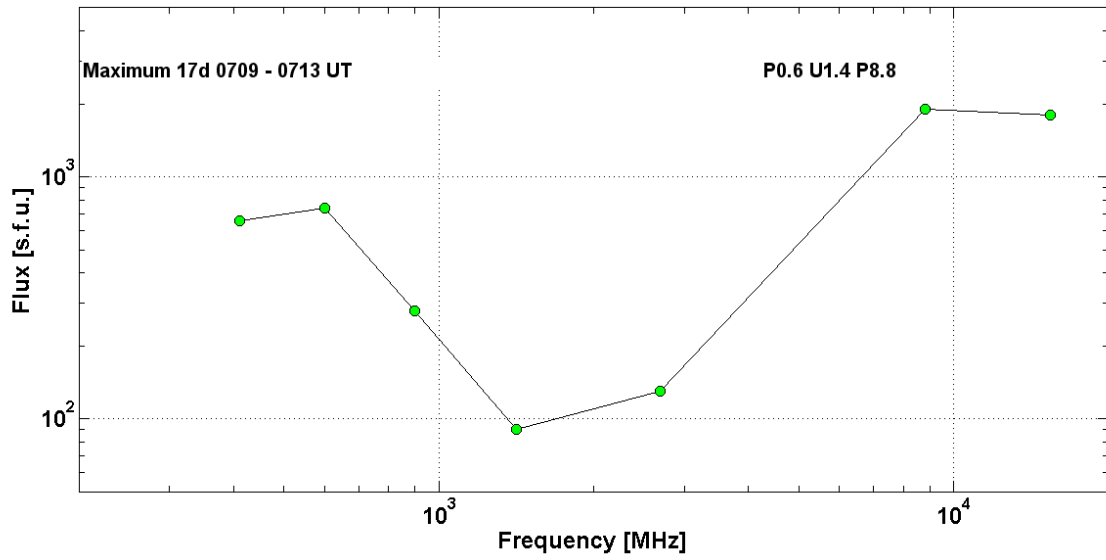
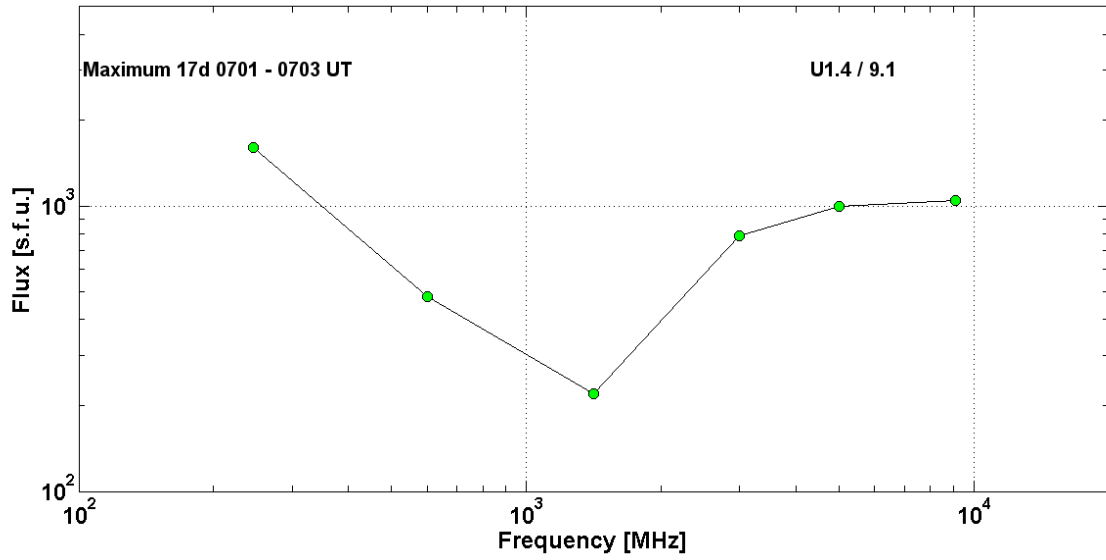
CME		2130	1300 km/s	-7.3 km/s ²	188°	045°	
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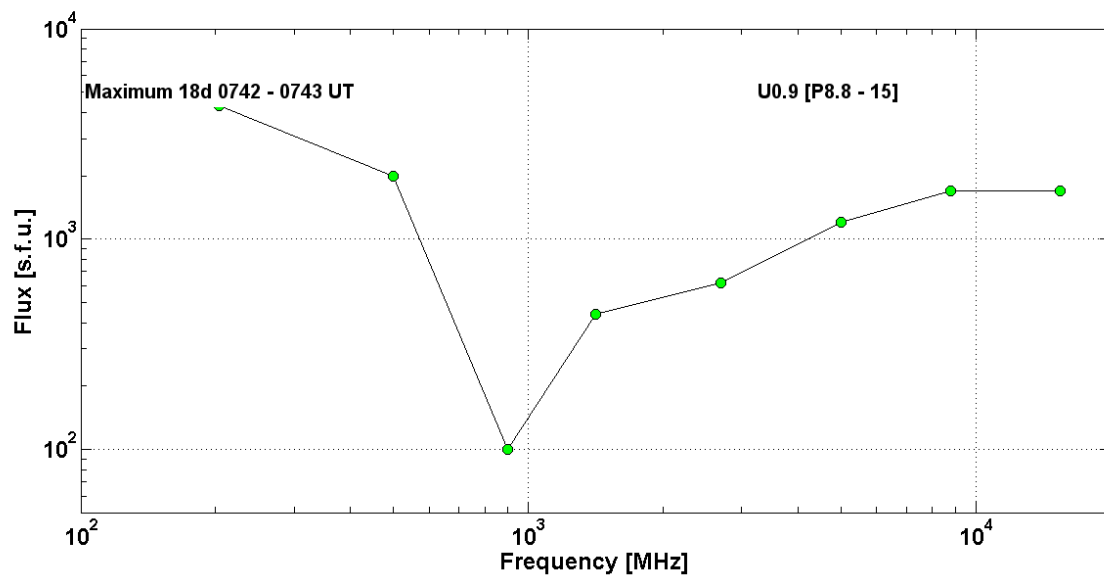


2002	July 17	Ø			AR10030	To event 425	
H α	6563 Å	0701	0704	0753	N20W16	1B	FU
1 – 12	keV	0658	0713	0753		M8.5	5.3E-2
50-100	keV	065812	070650	071044		M1.8	4.3E-2

1300-4000	keV						CORONAS
9.1	GHz	0658.5	0703.2	>0730.0	U1.4 / 9.1	3.02	
5	GHz	0700.0	0702.0	0716.0		3.00	
3	GHz	0700.2	0702.8	0715.9		2.90	
1.4	GHz	0700.0	0703.0	0714.0		2.34	
600	MHz	0700.1	0701.4	0725.5		2.68	
245	MHz	0657.0	~0702.0	0721.0		3.20	
DS II		0706		0710	25-48	2	
DS IV		0700		0722	40-800	3	
DS III	G	0700		0713	25-330	3	
DS V		0700		0706	25-180	2	
DS UNCLF	DC	0705		0708	25-45	2	
15.4	GHz	0700.0	0712.0	0721.0		3.26	
8.8	GHz	0700.0	0712.0	0725.0	P0.6 U1.4 P8.8	3.28	
2.7	GHz	0708.0	0712.0	0713.0		2.11	
1.4	GHz	0711.0	0712.0	0713.0		1.95	
900	MHz	0658.0	0713.0			2.45	
600	MHz	0700.1	0711.8			2.87	
410	MHz	0701.0	0709.0	0721.0		2.82	
DS III	S,C,F,S	0709		0713	25-270	2	
DS III		0720		0721	25-115	2	
DS V		0720		0721	25-82	2	
DS UNCLF	C	0711		0712	190-270	2	
15.4	GHz	0742.0	0743.0	0748.0	U0.9 [P8.8-15]	3.23	
8.8	GHz	0741.0	0743.0	0750.0		3.23	
5	GHz	0740.0	0743.0	0751.0		3.08	
2.7	GHz	0741.0	0743.0	0744.0		2.79	
1.4	GHz	0741.0	0743.0	0750.0		2.64	
900	MHz	0740.3	0743.5	0755.3		~2.00	
500	MHz	0740.0	0743.0	0758.0		3.30	
204	MHz	0738.8	0742.5	0751.8		3.63	
DS II	F,H	0742		0758	40-450	3	
DS II		0755		0802	50-90	2	
DS IV		~0756		~1055	45-270	2	
DS I	GG,DC	0744		0745	165-270	2	
DS III	G	0740		0757	25-600	3	
DS V		0741		0744	25-180	3	
DS UNCLF	DC	0744		0746	25-95	2	

CME		0731	0716 km/s	-17.8 km/s ²	177°	032°	
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PART 2. Event 2002.07.19 – (2002-200)

Particle event: To(Ep>10 MeV) – 19d05^h

Tmax(Ep>10 MeV) – 19d11^h, Jmax (Ep>10 MeV) – 3.6 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 220 MeV

Sources: ☉solar flare 18^d 07^h 24^m, X1.8/2B, N19W3 AR10030;

☐ flare activity of AR10039, 3^d behind E-limb:

∅ CME: 18d19^h 31^m, V = 2191 km/s, Δφ = 360°, dA = 104°;

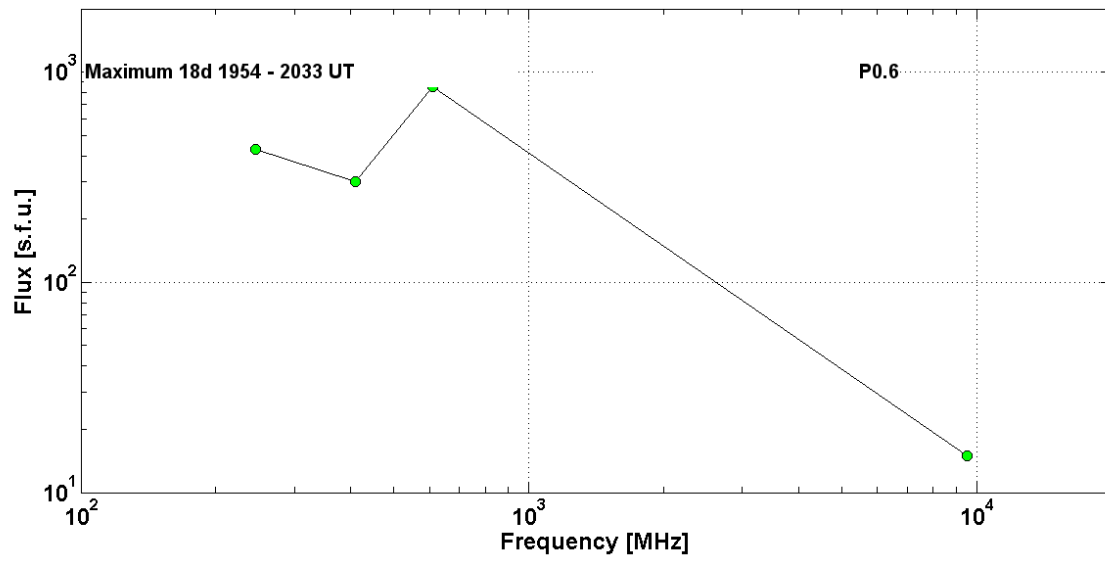
Main X-ray burst 1–8 Å: onset – 18d07^h24^m, max – 18d07^h44^m, Φ = 0/0056 J/m²

CME: 18d08^h06^m, V = 1099 km/s, Δφ = 360°, dA = 354°;

▲ SC 19d11^h09^m

2002	July 18	☉			AR10030	To event 426	
Hα	6563 Å	0741	0743	0801	N19W33	2B	FU
1 – 12	keV	0724	0744	0749		X1.8	5.6E-2
CME		0806	1099 km/s	-30.2km/s ²	360°	354°	0806

2002	July 18	∅			AR10039	To event 426	
Hα	6563 Å	No Flare Patrol					
1 – 12	keV	1952	1957	2006		C2.1	1.5E-3
12 - 25	keV	195256	195438	200308		137568	HESSI
9.5	GHz	1953.7	1954.7	1955.6		1.18	
610	MHz	1949.0	2014.0	2045.0	P0.6	2.93	
410	MHz	1950.0	2000.0	2045.0		2.48	
245	MHz	2033.0	2033.0	2034.0		2.63	
DS III	B	2037		2039	25-300	3	
DS III	B	2047		2047	25-130	1	
DS V		2033		2035	25-180	2	
CME		1931	2191 km/s	-129.3km/s ²	360°	104°	



PART 2. Event 2002.07.22 – (2002-203)

Particle event: To(Ep>10 MeV) – 22d01^h

Tmax(Ep>10 MeV) – 22d11^h, Jmax(Ep>10 MeV) – 18.5 /cm².s.sr

Duration of the event – 10 days

Maximum recorded proton energy of the event – Emax = 90 MeV

Sources: ● solar flare 20d21^h04^m, X3.3/..., s13e87*, AR10039

∅ solar flare 23d00^h18^m, X4.8/2B, S12E70, AR10039

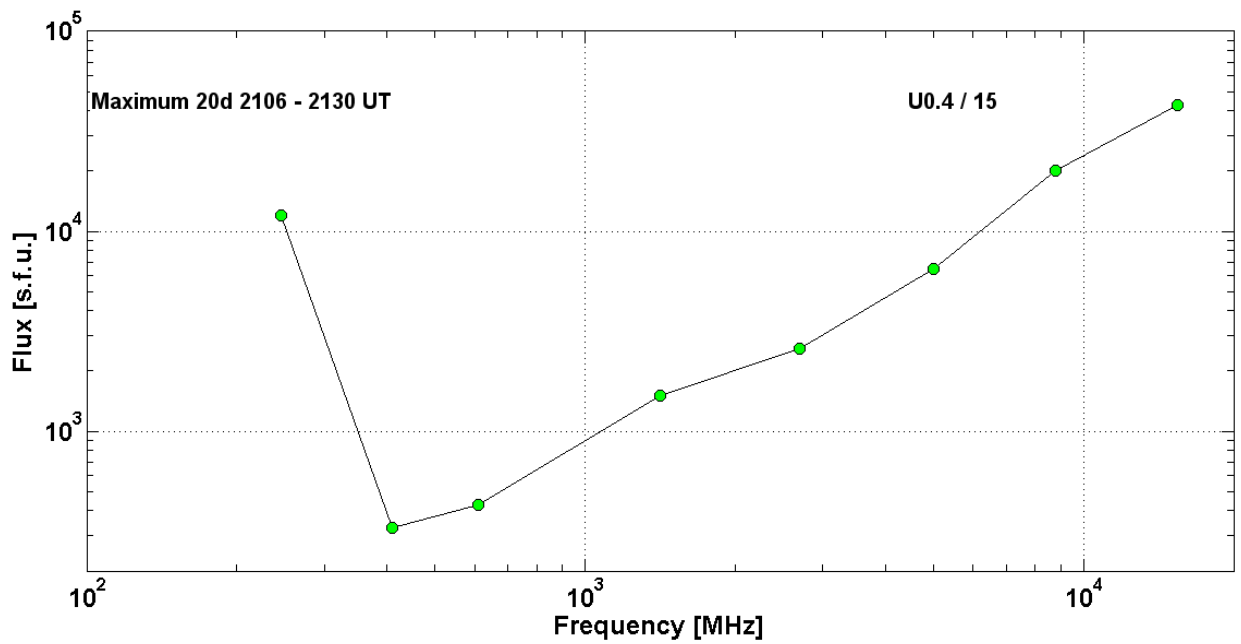
Main X-ray burst 1–8 Å: onset – 20d21^h04^m, max – 20d21^h30^m, Φ = 0.72 J/m²

CME: 20d22^h06^m, V = 1941 km/s, Δφ = 360°, = 91°

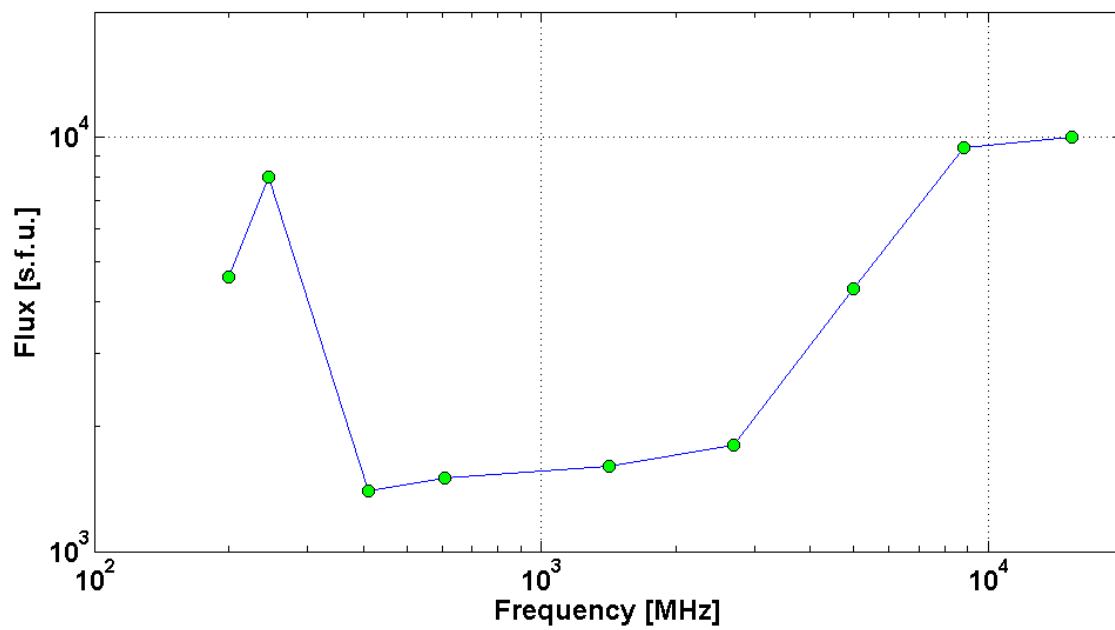
* – probable localization of the flare event

2002	July 20	●			AR10039	To event 427	
Hα	6563 Å	No Flare Patrol			s13e87		
1 – 12	keV	2104	2130	2154		X3.3	7.2E-1
100-300	keV	213000	213810	215300		50909556	HESSI
500-1300						Coronas-F, SONG	
15.4	GHz	2105.0	2128.0	2203.0	U0.4 / 15	4.63	
8.8	GHz	2105.0	2130.0	2203.0		4.30	
5	GHz	2104.0	2130.0	2203.0		3.81	
2.7	GHz	2104.0	2129.0	2203.0		3.41	
1.4	GHz	2105.0	2127.0	2203.0		3.18	
610	MHz	2106.0	2109.0	2203.0		2.63	
410	MHz	2106.0	2130.0	2155.0		2.52	
245	MHz	2106.0	2106.0	2154.0		4.08	
DS II		2107		2128	30-240	3	
DS II	SH	2110		2120	110-400	3	
DS IV		2107		2126	57-1300	1	
DS IV		<2128		2152	60-1700	1	
DS I	S	2140		2213	140-180	1	
DS III	G	2107		2111	57-330	3	
DS III	N	2107		2129	25-180	2	
DS III	G	2127		2130	57-1700	2	
15.4	GHz	2105.0	2128.0	2203.0	U0.4 / 15	4.63	
8.8	GHz	2105.0	2130.0	2203.0		4.30	
5	GHz	2104.0	2130.0	2203.0		3.81	
2.7	GHz	2104.0	2129.0	2203.0		3.41	
1.4	GHz	2105.0	2127.0	2203.0		3.18	
610	MHz	2106.0	2109.0	2203.0		2.63	
410	MHz	2106.0	2130.0	2155.0		2.52	
245	MHz	2106.0	2106.0	2154.0		4.08	
DS II		2107		2128	30-240	3	

DS II	SH	2110		2120	110-400	3	
DS IV		2107		2126	57-1300	1	
DS IV		<2128		2152	60-1700	1	
DS I	S	2140		2213	140-180	1	
DS III	G	2107		2111	57-330	3	
DS III	N	2107		2129	25-180	2	
DS III	G	2127		2130	57-1700	2	
n°						Mauna Kea, Haleakala	
CME		2206	1941 km/s	–	360°	091°	



2002	July 23	Ø			AR10039	To event 427	
H α	6563 Å	0023	0029	0240	S12E70	2B	EF
1 – 12	keV	0018	0035	0047		X4.8	4.6E-1
300-800	keV	001816	003038	011608		188025680	HESSI
6 – 12	keV	015216	015222	015428		95520	HESSI
15.4	GHz	0023.0	0031.0	0145.0	U0.4 / 15	4.00	
8.8	GHz	0022.0	0038.0	0145.0		3.97	
5	GHz	0021.0	0038.0	0144.0		3.63	
2.7	GHz	0022.0	0029.0	0144.0		3.26	
1.4	GHz	0025.0	0028.0	0000.0		3.20	
610	MHz	0025.0	0029.0	0133.0		3.18	
410	MHz	0025.0	0029.0	0000.0		3.15	
245	MHz	0026.0	0029.0	0000.0		3.90	
200	MHz	0026.0	0029.0	0118.0		3.66	
DS II		0029		0053	25-260	3	
DS IV		0028		0046	57-1500	1	
DS IV		0050		0226	25-180	1	
DS I	S,C	0046		~0130	75-160	1	
DS III	G	0027		0031	57-1300	1	
DS III		0028		0031	25-180	2	
DS III	G	0038		0040	57-300	2	
CME		0042	2285 km/s	–	360°	087°	



PART 2. Event 2002.08.14 – (2002-226)

Particle event: To(Ep>10 MeV) – 14d06^h

Tmax₁(Ep>10 MeV) – 14d09^h, Jmax₁(Ep>10 MeV) – 6.7 /cm².s.sr

Tmax₂(Ep>10 MeV) – 14d16^h, Jmax₂(Ep>10 MeV) – 6.9 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 85 MeV

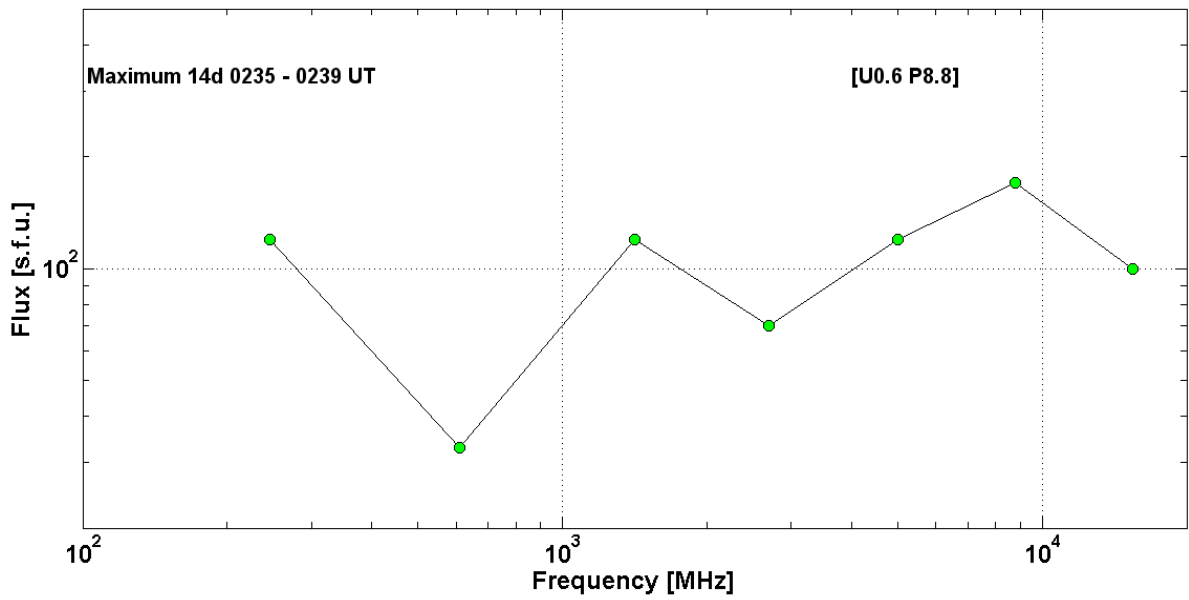
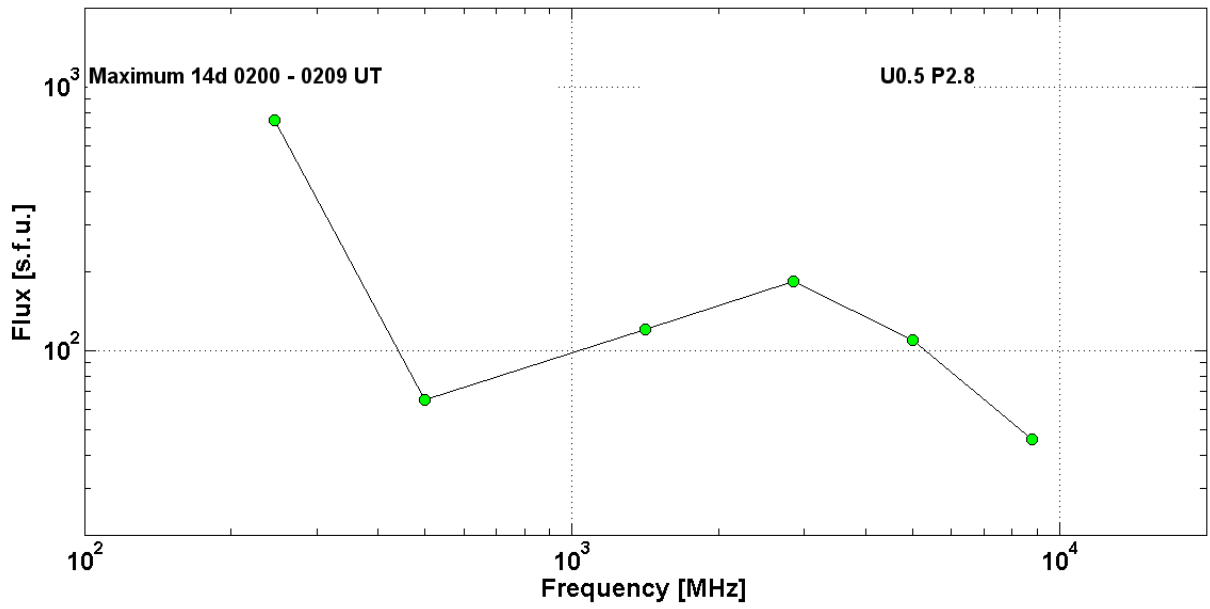
– Emax₂ = 55 MeV

Sources: • solar flare 14d01^h47^m, M2.3/1N, N09W54, AR10061

Main X-ray burst 1-8 Å: onset – 14d01^h47^m, max – 14d02^h12^m, Φ = 0.06 J/m²

CME: 14d02^h30^m, V = 1309 km/s, Δφ = 133°, dA = 282°;

2002	August 14	• AR10039				To event 428	
Hα	6563 Å	0147	0201	0343	N09W54	1N	EF
1 – 12	keV	0147	0212	0246		M2.3	6.0E-2
12-25	keV	021400	021422	023428		4238062	HESSI
6-12	keV	023428	023606	031500		1477953	HESSI
8.8	GHz	0201.0	0209.0	0210.0		1.66	
5	GHz	0149.0	0201.0	0308.0		2.04	
2.8	GHz	0143.0	0202.2	0259.0	U0.5 P2.8	2.26	
1.4	GHz	0144.0	0203.0	0000.0		2.08	
500	MHz	0145.0	0203.0	0245.0		1.81	
245	MHz	0152.0	0200.0	0223.0		2.88	
DS II		0157		0208	25-157	3	
DS III	G	0155		0158	25-140	1	
DS III	G	0157		0159	57-160	2	
DS V		0159		0205	25-144	3	
15.4	GHz	0232.0	0235.0	0246.0		2.00	
8.8	GHz	0232.0	0235.0	0246.0	[U0.6 P8.8]	2.23	
5	GHz	0232.0	0235.0	0246.0		2.08	
2.7	GHz	0232.0	0235.0	0246.0		1.85	
1.4	GHz	0239.0	0239.0	~0239.0		2.08	
610	MHz	0235.0	0235.0	~0235.0		1.52	
245	MHz	0234.0	0239.0	0246.0		2.08	
DS III		0300		0304	25-180	1	
DS III	B	0304		0305	25-400	2	
CME		0230	1309 km/s	-28.5	133°	282°	



PART 2. Event 2002.08.17 – (2002-229)

Particle event: To(Ep>10 MeV) – 17d00^h

Tmax(Ep>10 MeV) – 17d10^h, Jmax (Ep>10 MeV) – 1.7 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 75 MeV

Sources: ● solar flare 16d11^h11^m, 2N/M5.2, S14E20, AR10069

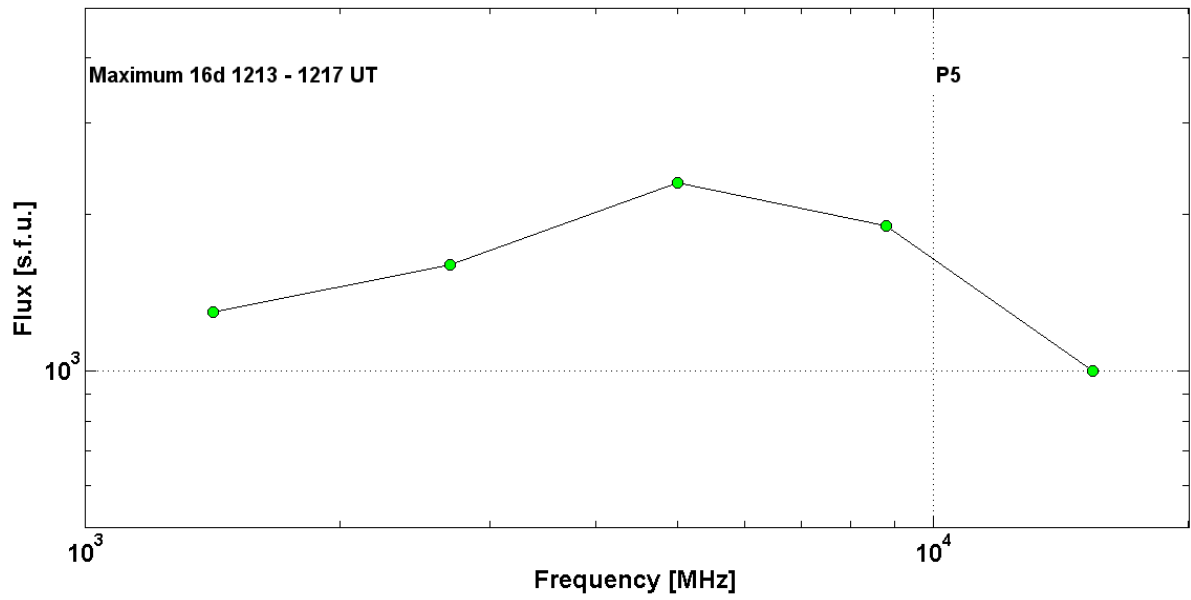
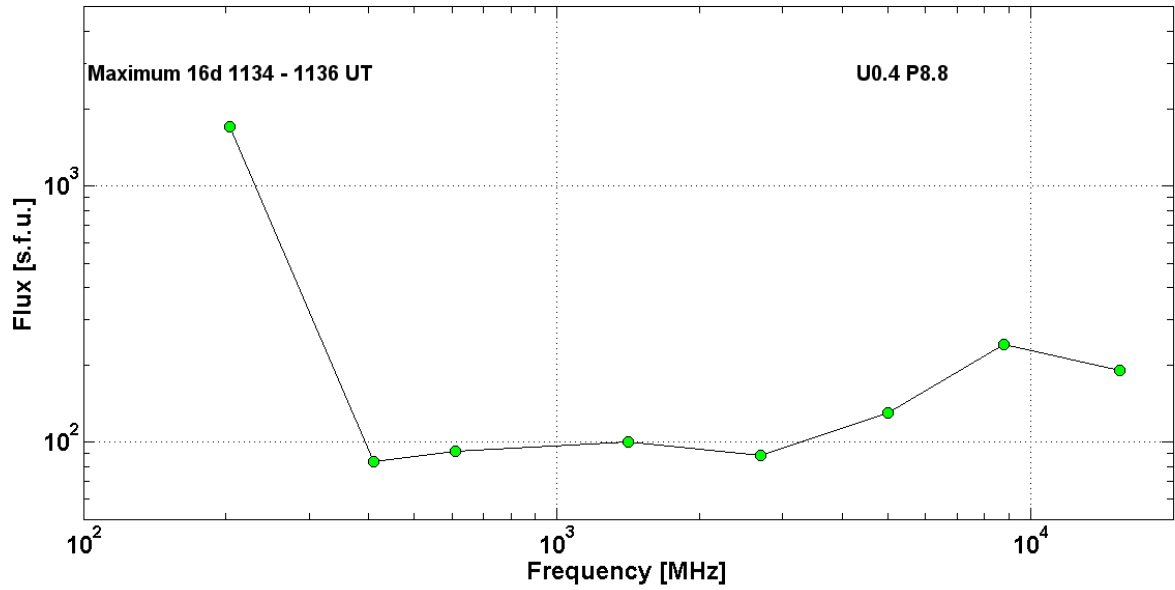
Main X-ray burst 1–8 Å: onset – 16d11^h32^m, max – 16d12^h32^m, Φ = 0.16 Jo./m²

CME: 16d12^h30^m; V= 1585 km/s, Δφ = 360°, dA= 121°.

▲ SC 18d18^h46^m;

2002	August 16	●	AR10069	To event 429			
Hα	6563 Å	1111	1213	1409	S14E20	2N	FH
1 – 12	keV	1132	1232	1307		M5.2	1.6E-1
50-100	keV	12:06:04	12:21:18	12: 31:56		20782080	HESSI
25 – 50	keV	13:38:24	13:46:54	14:06:16		1091448	HESSI
15.4	GHz	1133.0	1135.0	1143.0		2.28	
8.8	GHz	1132.0	1135.0	1143.0	U0.4 P8.8	2.38	
5	GHz	1133.0	1135.0	0000.0		2.11	
2.7	GHz	1133.0	1136.0	1143.0		1.95	
1.4	GHz	1132.0	1135.0	1143.0		2.00	
610	MHz	1132.0	1134.0	1143.0		1.96	
410	MHz	1133.0	1135.0	1143.0		1.92	
204	MHz	1134.2	1135.3	1138.0		3.23	
DS II		1144		1147	45-65	2	
DS I	S,C	1156		~1335	45-270	2	
DS III	B	1127		1128	25-95	2	
DS III	GG,C	1133		1141	55-270	2	
DS III	N	1143		1205	30-75	2	
DS III	GG,FS	1145		1150	25-270	2	
DS III	N	1149		1205	25-180	2	
DS DCIM	S,P	1132		1145	130-4000	3	
15.4	GHz	1133.0	1213.0	1441.0		3.00	
8.8	GHz	1132.0	1213.0	1428.0		3.28	
5	GHz	1133.0	1213.0	1448.0	P5	3.36	
2.7	GHz	1134.0	1214.0	1426.0		3.20	
1.4	GHz	1132.0	1217.0	1412.0		3.11	
DS II		1205		1317	100-600	3	
DS II		1206		1224	25-180	3	
DS IV		1205		1726	25-180	3	
DS III	GG,FS	1203		1215	25-270	2	
DS III	S	1215		~1335	25-270	2	

DS CONT	GG,FS	1204		~1335	45-270	2	
DS DCIM	P,C,S	1208		1317	100-4000	3	
CME		1230	1585 km/s	-67.1	360°	121°	



PART 2. Event 2002.08.18 – (2002-230)

Particle event: To(Ep>10 MeV) – 18d22^h

Tmax₁(Ep>10 MeV) – 19d03^h, Jmax₁(Ep>10 MeV) – 2.3 /cm².s.sr

Tmax₂(Ep>10 MeV) – 19d12^h, Jmax₂(Ep>10 MeV) – 1.8 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 80 MeV

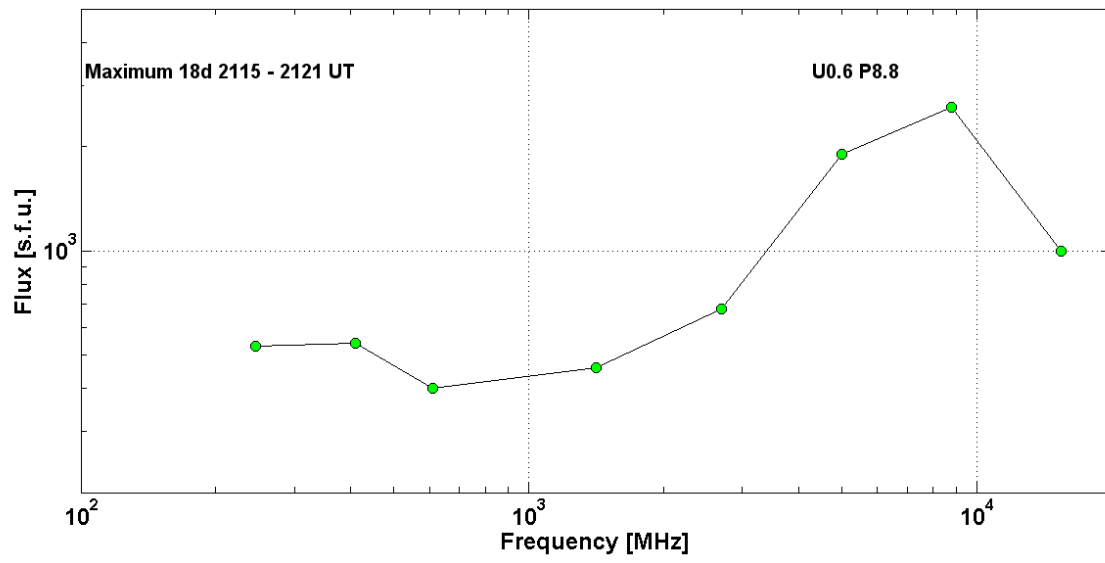
– Emax₂ = 70 MeV

Sources: • solar flare 18d21^h11^m, 1N/M2.2, S10W20 AR10069

Main X-ray burst 1–8 Å: onset – 18d21^h12^m, max – 18d21^h25^m, Φ = 0.22 J/m²

CME: 18d21^h54^m, V = 0682 km/s, Δφ = 140°, dA = 202°.

2002	August 18	•			AR10069	To event 430	
Hα	6563 Å	2111	2121	2200	S10W20	1N	FH
1 – 12	keV	2112	2125	2137		M2.2	2.2E-2
15.4	GHz	2115.0	2121.0	2131.0		3.00	
8.8	GHz	2113.0	2121.0	2134.0	U0.6 P8.8	3.41	
5	GHz	2113.0	2121.0	2132.0		3.28	
2.7	GHz	2114.0	2121.0	2130.0		2.83	
1.4	GHz	2114.0	2115.0	2125.0		2.66	
610	MHz	2113.0	2116.0	2124.0		2.60	
410	MHz	2113.0	2115.0	2123.0		2.73	
245	MHz	2111.0	2116.0	2139.0		2.72	
DS II		2124		2155	28-180	1	
DS II		2124		2135	25-130	3	
DS IV		2136		0140	25-180	1	
DS IV		2142		2320	30-80	2	
DS III	G	2110		2122	25-2000	3	
DS III	B	2142		2142	25-80	1	
DS III	G	2144		2148	330-530	1	
DS III	G	2159		2203	25-500	2	
DS CONT		2135		>2400	60-110	3	
CME		2154	0682km/s	1.9 km/s ²	140°	202°	



PART 2. Event 2002.08.20 – (2002-232)

Particle event: To(Ep>10 MeV) – 20d09^h

Tmax(Ep>10 MeV) – 20d10^h, Jmax (Ep>10 MeV) – 2.5 /cm².s.sr *)

Duration of the event – 1 day *)

Maximum recorded proton energy of the event – Emax = 80 MeV

*) Data from ACE (SIS)

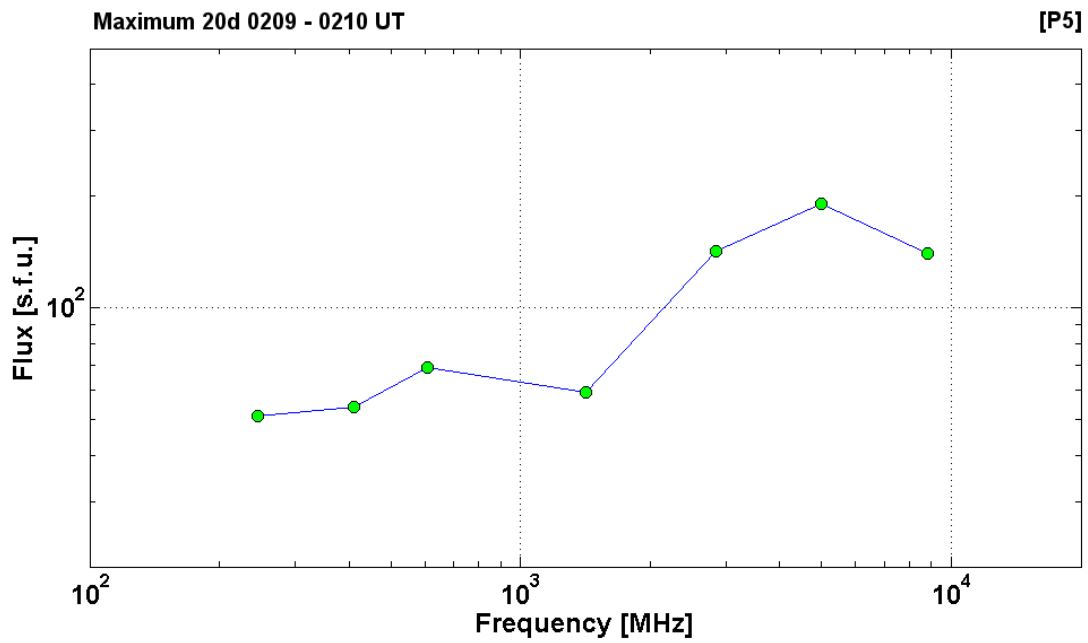
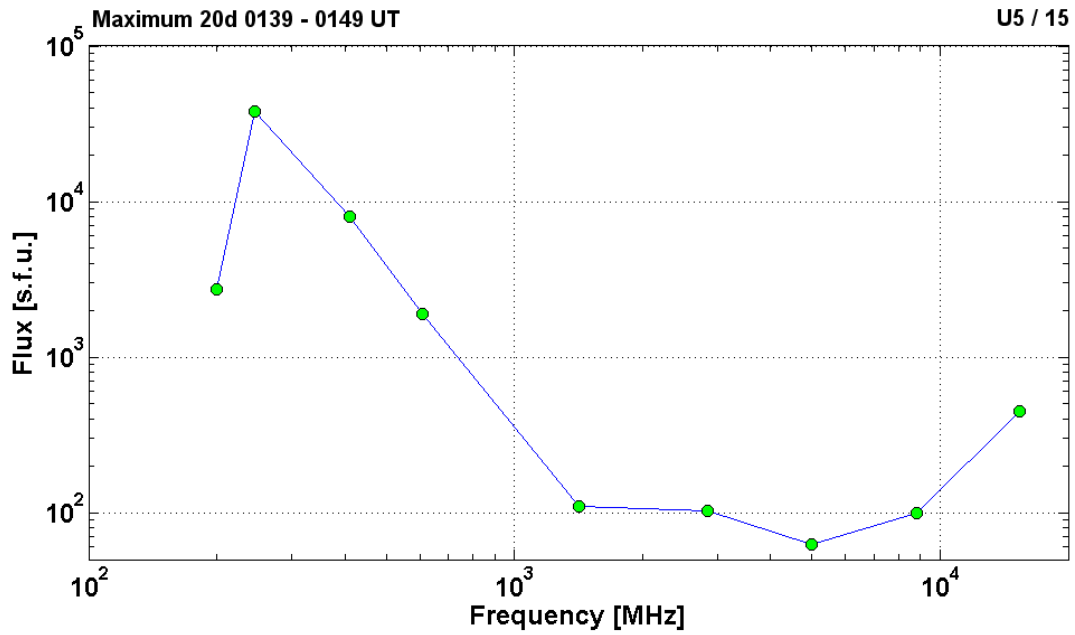
Sources: • solar flare 20d01^h33^m, M5.0/1B, S10W35, AR10069

Main X-ray burst 1–8 Å: onset – 20d01^h33^m, max – 20d01^h40^m, Φ = 0.12 J/m²

CME: 20d01^h54^m; V = 0961 km/s, Δφ = 360°, dA = 121°.

2002	August 20	•			AR10069	To event 431	
Hα	6563 Å	0135	0140	0202	S10W35	1B	EF
1 – 12	keV	0133	0140	0143		M5.0	1.2E-2
6 – 12	keV	010820	010950	011120		1820	HESSI
6 – 12	keV	011120	011242	011400		1670	HESSI
6 – 12	keV	0115	011554	012028		7513	HESSI
6 – 12	keV	012028	012426	012652		8551	HESSI
12 – 25	keV	012652	012858	013044		5535	HESSI
25 – 50	keV	013044	014022	014836		6439679	HESSI
25 – 50	keV	014836	015022	020300		707341	HESSI
15.4	GHz	0149.0	0149.0	0151.0	U5 / 15	2.65	
8.8	GHz	0139.0	0140.0	0141.0		2.00	
5	GHz	0139.0	0139.0	0140.0		1.80	
2.8	GHz	0137.0	0139.5	0152.0		2.01	
1.4	GHz	0138.0	0139.0	0139.0		2.04	
610	MHz	0138.0	0139.0	0000.0		3.28	
410	MHz	0134.0	0139.0	0142.0		3.90	
245	MHz	0134.0	0139.0	0143.0		4.58	
200	MHz	0137.0	0139.0	0147.0		3.43	
DS III	G	0134		0149	25-1600	3	
8.8	GHz	0208.0	0209.0	0210.0		2.15	
5	GHz	0207.0	0209.0	0214.0	[P5]	2.28	
2.8	GHz	0204.0	0209.1	0230.0		2.15	
1.4	GHz	0208.0	0209.0	0210.0		1.77	
610	MHz	0209.0	0209.0	0210.0		1.84	
410	MHz	0209.0	0209.0	~0209.0		1.73	
245	MHz	0210.0	0210.0	~0210.0		1.71	
DS I	S	0247		0350	100-180	1	
DS III	G	0208		0209	57-160	3	
DS III	G	0208		0212	25-270	2	
DS III	G	0210		0210	57-1000	1	
DS III	G	0211		0212	57-130	2	

15.4	GHz	0254.0	0255.0	0301.0		2.26	
8.8	GHz	0255.0	0257.0	0258.0		1.86	
200	MHz	0258.0	0258.0	0312.0		2.18	
DS I	S	0247		0350	100-180	1	
CME		0154	0961 km/s	1.7 km/s ²	157°	210°	



PART 2. Event 2002.08.22 – (2002-234)

Particle event: To(Ep>10 MeV) – 22d03^h

Tmax(Ep>10 MeV) – 22d05^h, Jmax (Ep>10 MeV) – 16 /cm².s.sr

Duration of the event – 2 days

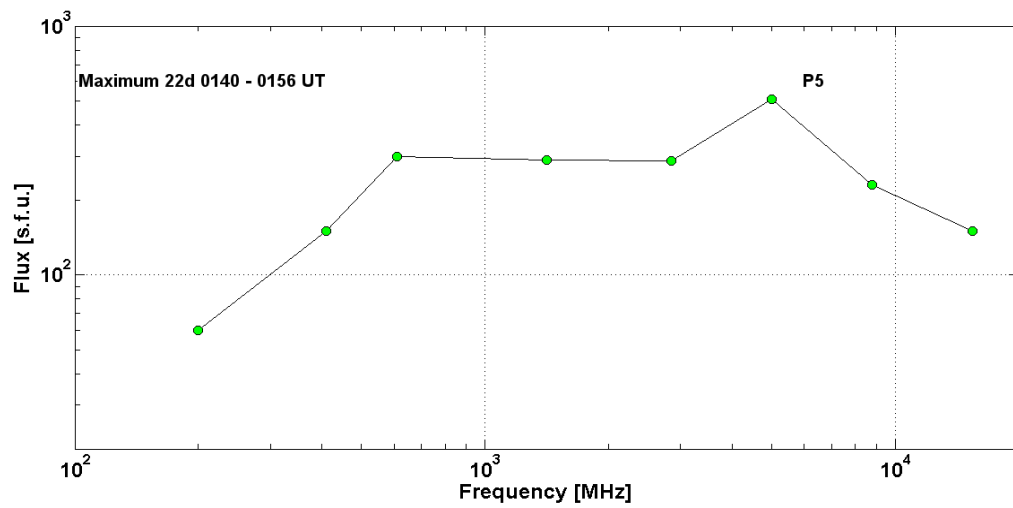
Maximum recorded proton energy of the event – Emax = 450 MeV

Sources: • solar flare 22d01^h47^m, M5.4/2B, S07W62, AR10069

Main X-ray burst 1–8 Å onset – 22d01^h47^m, max – 22d01^h57^m, Φ = 0.033 J/m²

CME: 22d02^h06^m; V = 998 km/s, Δφ = 360°, dA = 231°.

2002	August 22	•		AR10069		To event 432	
Hα	6563 Å	0151	0153	0225	S07W62	2B	EF
1 – 12	keV	0147	0157	0205		M5.4	3.3E-2
50-100	keV	014508	015422	022212		9830232	HESSI
15.4	GHz	0153.0	0156.0	0208.0		2.18	
8.8	GHz	0151.0	0156.0	0206.0		2.36	
5	GHz	0150.0	0151.0	0200.0	P5	2.71	
2.8	GHz	0136.0	0152.3	0240.0		2.46	
1.4	GHz	0150.0	0151.0	0153.0		2.46	
610	MHz	0150.0	0153.0	0154.0		2.48	
410	MHz	0139.0	0140.0	0140.0		2.18	
200	MHz	0153.0	0154.0	0155.0		1.78	
DS II		0156		0205	25-200	2	
DS IV		0209		0218	25-180	1	
DS IV	FS	~0210		>0358	57-280	1	
DS III	GG	0151		0155	57-1300	3	
DS III	G	0151		0156	25-280	3	
DS III	G	0202		0203	57-130	3	
DS III	G	0206		0214	30-190	2	
CME		0206	0998 km/s	-32.8km/s ²	360°	153°	



PART 2. Event 2002.08.24 – (2002-236) – GLE-64

Particle event: To(Ep> 10MeV) – 24d01^h

Tmax(Ep>10 MeV) – 24d03^h, Jmax (Ep>10 MeV) – 92 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax = 1200 MeV

Sources: ● solar flare 24d00^h49^m, X3.1/1F, S02W81, AR10069

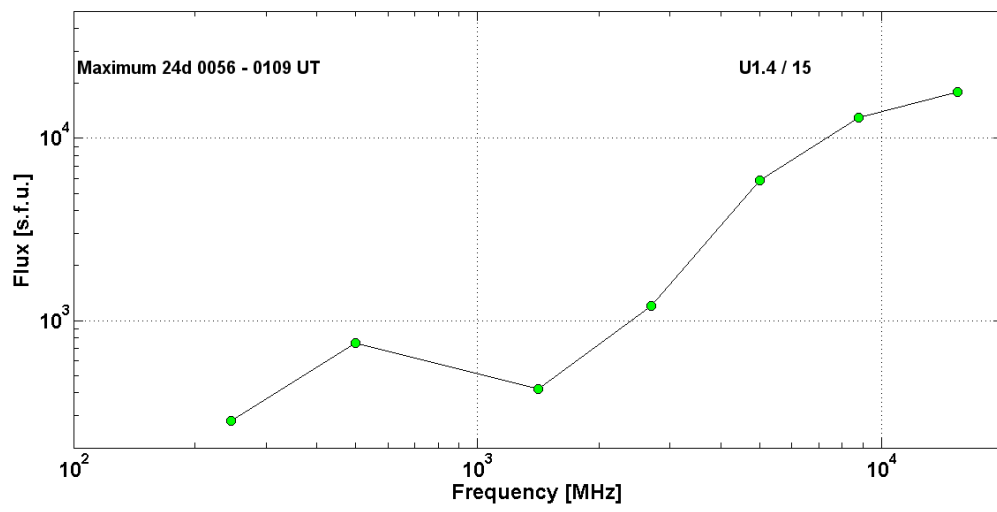
Main X-ray burst 1–8 Å: onset – 24d00^h49^m, max – 24d01^h12^m, Φ = 0.46 J/m²;

CME: 24d01^h27^m; V = 1913 km/s, Δφ = 360°, dA = 270°;

▲SC 26d11^h31^m

2002 August 24 ● AR10069 To event 433

Hα	6563 Å	0055	0103	0123	S02W81	1F	F
1 – 12	keV	0049	0112	0131		X3.1	4.6E-1
50–100	keV	004348	005730	005828		4036893	HESSI
25–50	keV	012824	012954	023428		51893096	HESSI
4–7	MeV					CORONAS-F	
15.4	GHz	0052.0	0100.0	0221.0	U1.4/15	4.26	
8.8	GHz	0051.0	0104.0	0219.0		4.11	
5	GHz	0050.0	0109.0	0219.0		3.77	
2.7	GHz	0050.0	0102.0	0207.0		3.08	
1.4	GHz	0054.0	0056.0	0146.0		2.62	
500	MHz	0053.0	0105.0	0119.0		2.88	
245	MHz	0101.0	0102.0	0128.0		2.45	
DS II		0101		0114	25-180	2	
DS IV		0115		0136	25-180	1	
DS III	G	0101		0103	60-1600	1	
DS III	G	0101		0104	57-180	3	
DS III	G	0104		0107	57-520	2	
DS CONT		~0108		0135	57-200	1	
CME		0127	1913 km/s	32.8km/s ²	360°	270°	



PART 2. Event 2002.09.06 – (2002-249)

Particle event: To(Ep>10 MeV) – 06d06^h

Tmax₁(Ep>10 MeV) – 06d14^h, Jmax₁(Ep>10 MeV) – 3 /cm².s.sr

Tmax₂(Ep>10 MeV) – 07d17^h, Jmax₂(Ep>10 MeV) – 67 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 80 MeV

– Emax₂ = 175 MeV

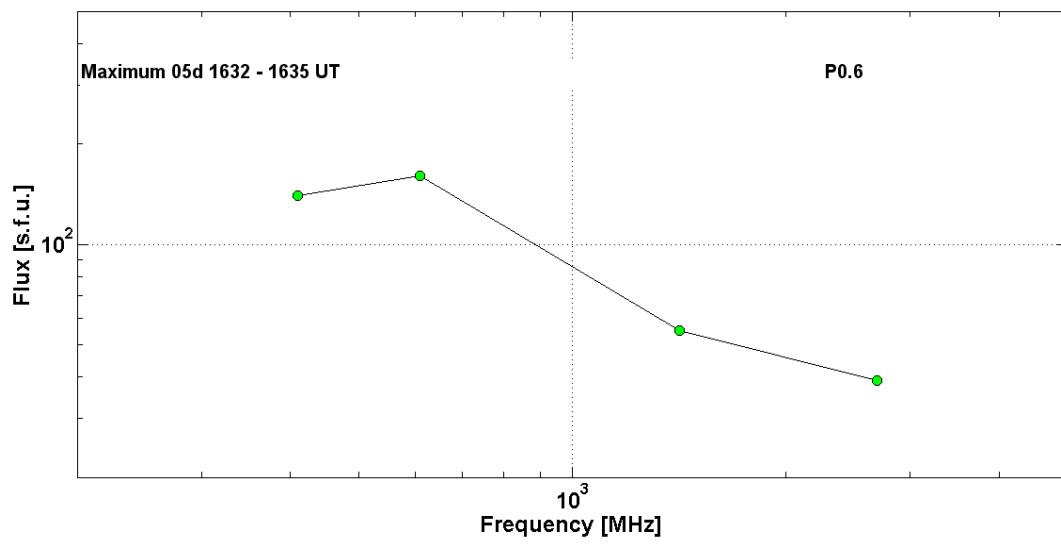
Sources: ☉ solar flare 05d16^h18^m, C5.2/SF, N12E28, AR10102

Main X-ray burst 1–8 Å: onset – 05d16^h18^m, max – 05d17^h 06^m, Φ = 0.016 J/m²

CME: 05d16^h54^m; V = 1748 km/s, Δφ = 360°, dA = 114°

▲ SC 07d16^h38^m

2002	September 05	☉			AR10102	To event 434	
Hα	6563 Å	1630	1645	1745	N12E28	SF	FU
1 – 12	keV	1618	1706	1735		C5.2	1.6E-2
6-12	keV	170620	170702	173008		121416	HESSI
2.7	GHz	1632.0	1632.0	~1632.0		1.59	
1.4	GHz	1630.0	1634.0	1635.0		1.74	
610	MHz	1629.0	1635.0	1643.0	P0.6	2.20	
410	MHz	1631.0	1634.0	1636.0		2.15	
DS II		1633		1647	40-250	2	
DS I	S,N	~1710		~1733	200-350	1	
DS III	B	1628		1628	40-65	2	
DS CONT		1635		0429	25-180	1	
DS DCIM		1632		1637	320-700	2	
DSF		~1631		~1734	N08E31	06°	
CME		1654	1748 km/s	43.0 km/s ²	360°	114°	



PART 2. Event 2002.11.09 – (2002-313)

Particle event: To(Ep>10 MeV) – 09d17^h

Tmax₁(Ep>10 MeV) – 10d02^h, Jmax₁(Ep>10 MeV) – 150 /cm².s.sr

Tmax₂(Ep>10 MeV) – 10d13^h, Jmax₂(Ep>10 MeV) – 40 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 165 MeV

– Emax₂ = 150 MeV

Sources: ● solar flare 09d13^h08^m, M4.6/2B, S12W29, AR10180

Ø solar flare 10d03^h 04^m, M2.4/2N, S12W37, AR10180

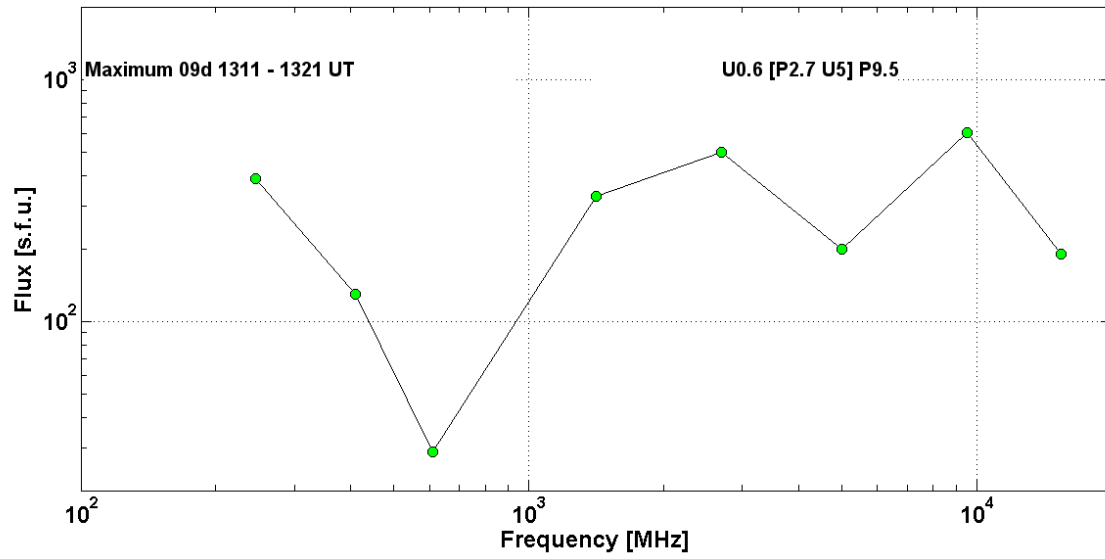
Main X-ray burst 1–8 Å: onset – 09d13^h08^m, max – 09d13^h23^m, Φ = 0.048 J/m²

CME: 09d13^h32^m; V = 1838 km/s, Δφ = 360°, dA = 233°.

▲ SC 09d17^h51^m; ▲ 09d18^h49^m; ▲ 11d12^h31^m

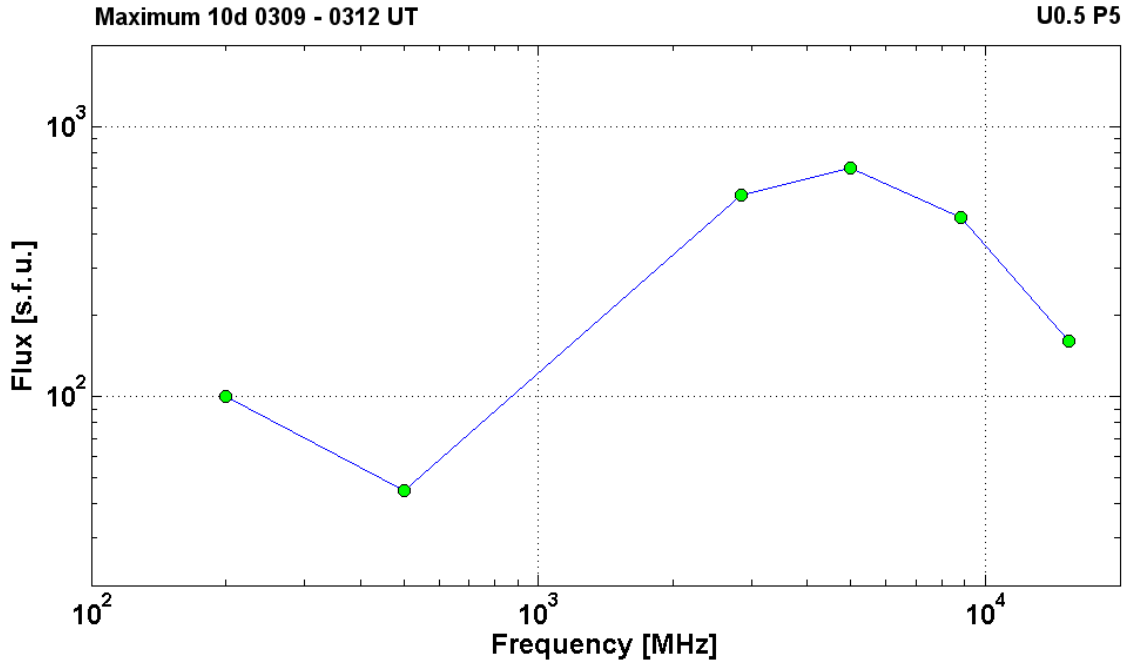
2002 November 09 ● AR10180 To event 435

Hα	6563 Å	1309	1322	1428	S12W29	M4.6/2B	FU
1 – 12	keV	1308	1323	1336		M4.6	4.8E-2
100–300	keV	130712	132150	132840		9681024	HESSI
25 – 50	keV	1400	140534	140932		172848	HESSI
12 – 25	keV	140932	141134	14262		140472	HESSI
15.4	GHz	1312.0	1317.0	0000.0		2.28	
9.5	GHz	1310.0	1321.2	1328.1	U0.6 [P2.7 U5] P9.5	2.78	
5	GHz	1311.0	1312.0	0000.0		2.30	
2.7	GHz	1310.0	1316.0	0000.0		2.70	
1.4	GHz	1311.0	1316.0	0000.0		2.52	
610	MHz	1311.0	1311.0	~1311.0		1.46	
410	MHz	1312.0	1314.0	0000.0		2.11	
245	MHz	1309.0	1312.0	0000.0		2.59	
DS II		1317		1337	25-85	2	
DS IV		1307		1353	25-180	2	
DS IV	P,F	1308		1324	100-4000	3	
DS III		1402		1405	25-180	1	
DS DCIM	GG,FS,SP	1307		1330	800-2000	2	
DS DCIM	GG	1310		1328	2000-4500	2	
CME		1332	1838km/s	35.4 km/s ²	360°	233°	



2002	November 10	Ø	AR10180	To event 435			
H α	6563 Å	0307	0314	0358	S12W37	2N	FU
1 – 12	keV	0304	0321	0335		M2.4	3.0E-2
100-300	keV	030520	031654	035508		7302648	HESSI
15.4	GHz	0311.0	0312.0	0313.0		2.20	
8.8	GHz	0309.0	0311.0	0315.0		2.66	
5	GHz	0308.0	0311.0	0317.0	U0.5 P5	2.85	
2.8	GHz	0301.0	0311.3	0333.0		2.75	
500	MHz	0307.0	0311.0	0321.0		1.65	
200	MHz	0307.0	0309.0	0317.0		2.00	
DS II		0314		0325	25-180	3	
DS II	FN	0317		0323	18-50	3	
DS II	FN	0320		0334	18-80	3	
DS II	SH	0320		0334	40-160	3	
DS III	GG	0307		0313	18-800	3	
DS III	G	0313		0319	23-480	1	
DS CONT		0325		0335	25-180	1	

CME		0330	1670km/s	35.4 km/s ²	360°	316°	
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PART 2. Event 2003.05.28 – (2003-148)

Particle event: To(Ep>10 MeV) – 28d04^h

Tmax₁(Ep>10 MeV) – 28d11^h, Jmax₁(Ep>10 MeV) – 2 /cm².s.sr

Tmax₂(Ep>10 MeV) – 29d16^h, Jmax₂(Ep>10 MeV) – 77 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = MeV

– Emax₂ = 175 MeV

Source: • solar flare 27d22^h 56^m, X1.3/2B, S06W20, AR10365*

X3.6/2B, S06W20, AR10365*

Ø solar flare 29d00^h 20^m, X1.3/2B, S06W37, AR10365

Main X-ray burst 1–8 Å: onset – 27d22^h56^m, max – 27d23^h07^m, Φ = 0.071 J/m²

– 28d00^h 17^m, max – 28d00^h27^m, Φ = 0.28 J/m²

CME: 27d23^h50^m, V = 0964 km/s, Δφ = 360°, dA = 067°

CME: 28d00^h50^m, V = 1366 km/s, Δφ = 360°, dA = 292°

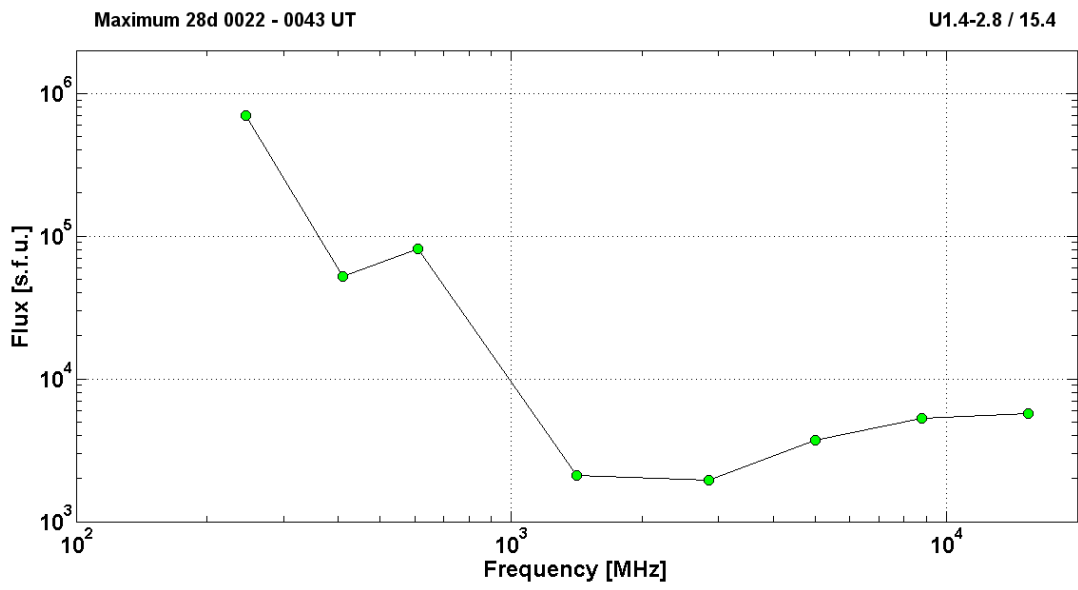
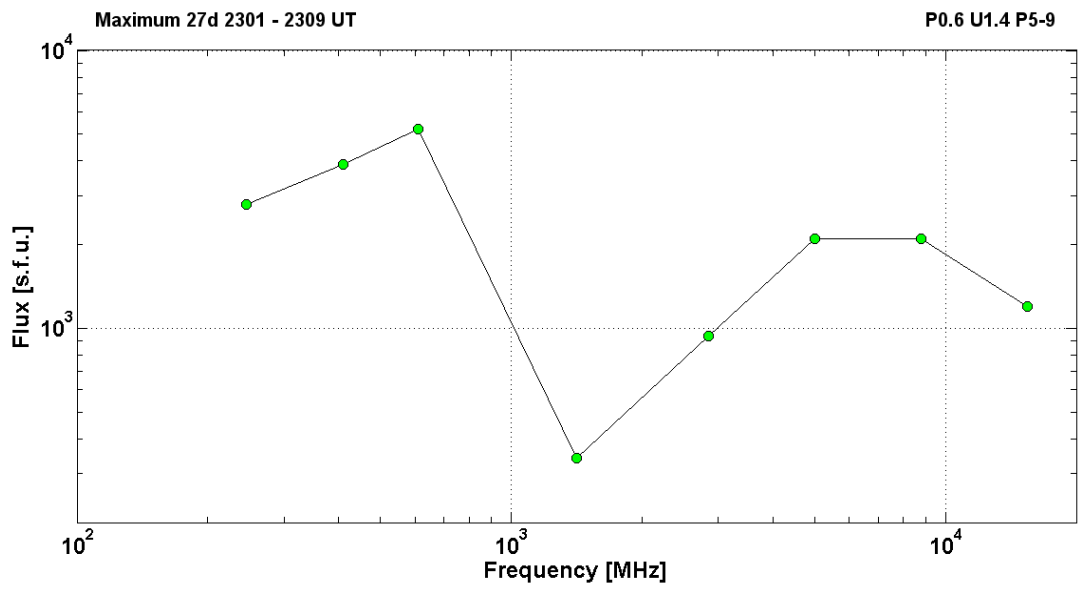
▲ SC: 29d12^h24^m

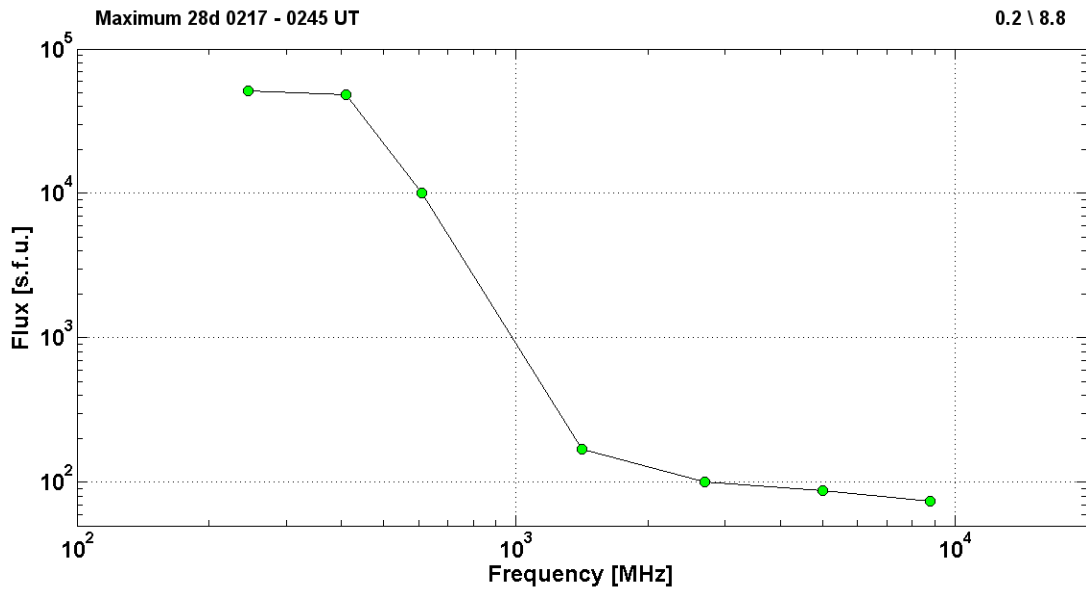
* One flare event with two X-ray bursts

2003	May 28	•	AR10365			To event 436	
Hα	6563 Å	2258	0047	0245	S06W20	2B	EFHTU
1–12	keV	2256	2307	2313		X1.3	7.1E-2
1–12	keV	0017	0027	0039		X3.6	2.8E-1
6–12	keV	230532	230610	231020		377798	
6–12	keV	231020	231642	232656		299981	HESSI
6–12	keV	23:25:56	23:27:50	23:30:20		28274	HESSI
6–12	keV	23:30:20	23:35:02	23:36:56		32609	HESSI
6–12	keV	23:36:56	23:38:30	23:41:48		28879	HESSI
12–25	keV	23:41:48	23:43:46	23:47:32		287482	HESSI
6–12	keV	23:47:32	23:48:38	23:49:20		10231	HESSI
6–12	keV	00:00:0	00:01:42	00:04:48		25575	HESSI
6–12	keV	00:42:32	00:43:22	00:45:24		1956	HESSI
25-50	keV	00:45:24	01:03:34	01:45:12		9968246	HESSI
12–25	keV	02:20:40	02:20:46	02:24:40		106590	HESSI
50–150	keV	00:21		00:29		CORONAS-F SONG	
4–7	MeV		>0021			CORONAS-F SONG	
15.4	GHz	2301.0	2306.0	2318.0		3.08	
8.8	GHz	2259.0	2305.0	2327.0	P0.6 U1.4 P5-9	3.32	
5	GHz	2259.0	2306.0	2326.0		3.32	
2.8	GHz	2248.0	2306.8	2345.0		2.97	
1.4	GHz	2300.0	2301.0	2321.0		2.53	
610	MHz	2300.0	2309.0	2332.0		3.72	
410	MHz	2259.0	2304.0	2336.0		3.59	
245	MHz	2259.0	2303.0	2336.0		3.45	
DS II	FN	2302		2310	50-300	3	

DS II		2306		2316	25-180	3	
DS IV	FS	2301		2317	200-1400	2	
DS IV		2311		0145	25-180	2	
DS III	GG	2300		2307	20-1400	3	
15.4	GHz	0020.0	0023.0	0107.0	U1.4-2.8 / 15.4	3.76	
8.8	GHz	0019.0	0024.0	0109.0		3.72	
5	GHz	0020.0	0025.0	0154.0		3.57	
2.8	GHz	0013.0	0022.9	0036.0		3.29	
1.4	GHz	0021.0	0023.0	0121.0		3.32	
610	MHz	0021.0	0027.0	0124.0		4.91	
410	MHz	0021.0	0043.0	0207.0		4.72	
245	MHz	0022.0	0022.0	0139.0		5.85	
DS II		0026		0033	25-180	3	
DS IV	FS	0022		0241	40-1600	3	
DS III	G	0022		0027	18-1800	3	
8.8	GHz	0228.0	0245.0	0248.0		1.87	
5	GHz	0218.0	0222.0	0246.0		1.94	
2.7	GHz	0218.0	0222.0	0225.0		2.00	
1.4	GHz	0215.0	0222.0	0229.0		2.23	
610	MHz	0207.0	0217.0	0239.0		4.00	
410	MHz	0207.0	0217.0	0300.0		4.68	
245	MHz	0207.0	0217.0	0300.0	0.2 \ 8.8	4.71	
°n							Mauna Kea, Norikura
CME		2350	0964 km/s	-9.6 km/s ²	360°	300°	2350
CME		0050	1366 km/s	25.9	360	292	0050

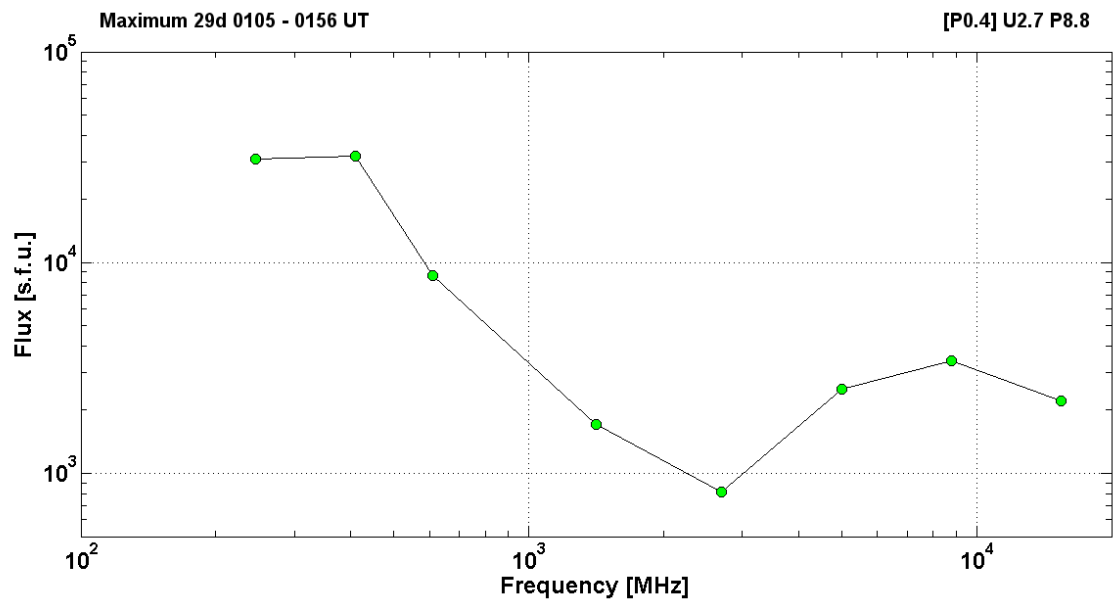
* One flare event with two X-ray bursts





2003	May 29	Ø	AR10365			To event 436	
H α	6563 Å	0020	0105	0223	S06W37	2B	FU
1 – 12	keV	0051	0105	0112		X1.3	6.8E-2
6-12	keV	004232	004322	004524		1956	HESSI
25-50	keV	004524	010334	014512		9968246	HESSI
12-25	keV	022040	022046	022440		106590	HESSI
15.4	GHz	0059.0	0105.0	0213.0		3.34	
8.8	GHz	0058.0	0105.0	0217.0	[P0.4] U2.7 P8.8	3.53	
5	GHz	0058.0	0105.0	0217.0		3.40	
2.7	GHz	0058.0	0105.0	0213.0		2.91	
1.4	GHz	0058.0	0156.0	0158.0		3.23	
610	MHz	0058.0	0152.0	0215.0		3.94	
410	MHz	0059.0	0152.0	0212.0		4.51	

245	MHz	0058.0	0150.0	0222.0		4.49	
DS II	FN	0106		0111	30-90	3	
DS IV	FS	0058		0213	40-1800	2	
DS III	G	0100		0106	18-1000	3	
DS III	G	0108		0111	18-90	3	
DS III	G	0213		0216	30-300	3	
DS UNCLF		0113		0116	40-120	2	
CME		0051	1237 km/s	-22.3km/s ²	360°	260°	



PART 2. Event 2003.05.31 – (2003-151)

Particle event: To(Ep>10 MeV) – 31d03^h

Tmax(Ep>10 MeV) – 31d06^h, Jmax (Ep>10 MeV) – 15.6 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 420 MeV

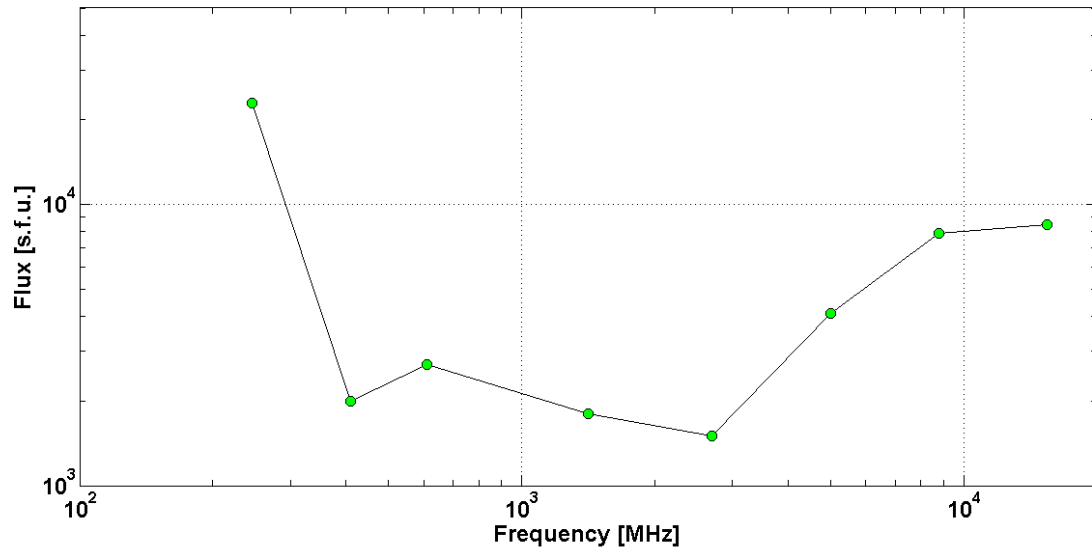
Sources: • solar flare 31d 02^h 13^m, M9.3/2B, S07W65 AR10365

Main x-ray burst 1–8 Å (12.4 – 1.55 keV):

onset – 31d02^h 13^m, max – 31d 02^h 24^m, Φ = 0.085 Jo.m⁻²

CME: 31d 02^h 30^m, V = 1835 km/s, Δφ = 360°, dA = 256°

2003	May 31	•	AR10365			To event 437	
Hα	6563 Å	0218	0223	0338	S07W65	2B	U
1 – 12	keV	0213	2224	0240		M9.3	8.5E-2
100 – 300	keV	022536	022702	023416		15794196	HESSI
12-25	keV	030048	030118	031840		630884	HESSI
12-25	keV	031840	031958	032444		112050	HESSI
15.4	GHz	0217.0	0222.0	0247.0	[U2.7]/15.4	3.93	
8.8	GHz	0216.0	0223.0	0251.0		3.90	
5	GHz	0216.0	0224.0	0248.0		3.61	
2.7	GHz	0216.0	0225.0	0247.0		3.18	
1.4	GHz	0217.0	0224.0	0234.0		3.26	
610	MHz	0218.0	0220.0	0238.0		3.43	
410	MHz	0220.0	0226.0	0248.0		3.30	
245	MHz	0214.0	0222.0	0249.0		4.36	
DS II	SH	0223		0235	35-180	3	
DS II		0223		0000	75-180	3	
DS IV		0218		0254	35-1800	2	
DS III	G	0220		0221	350-1000	2	
DS III	G	0221		0223	18-300	3	
DS V		0220		0227	25-180	3	
CME		0230	1835 km/s	-2.4 km/s ²	360°	256°	



PART 2. Event 2003.06.18 – (2003-169)

Particle event: To(Ep>10MeV) – 18d08^h

Tmax₁(Ep>10MeV) – 18d11^h, Jmax₁(Ep>10MeV) – 2 /cm².s.sr

Tmax₂(Ep>10MeV) – 19d06^h, Jmax₂(Ep>10MeV) – 10.2 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 200 MeV

– Emax₂ = 200 MeV

Sun source: ● solar flare 17d22^h 27^m, M6.8/..., s12e53, AR10386*

Main x-ray burst 1–8 Å: onset – 22^d 27^h 09^m, max – 22^h 55^m, Φ = 0.096 Jo.m⁻²

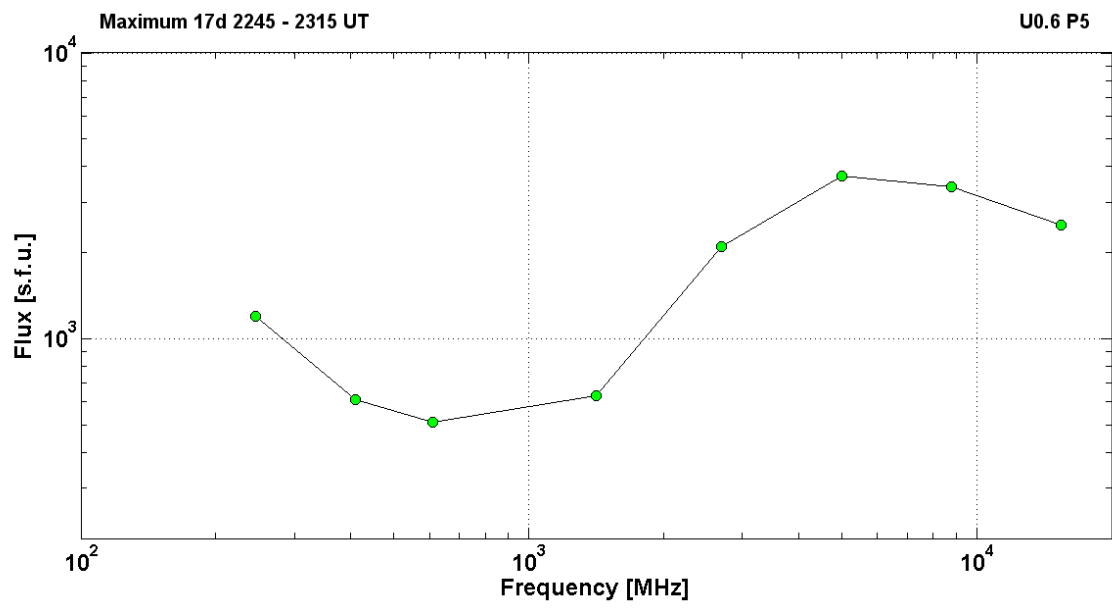
CME: 17d23^h18^m, V = 1813 km/s, Δφ = 360°, dA = 117°

Δ SC 18d05^h12^m

* – probable localization of the flare event

2003 June 17 ● AR10386 To event 438

Hα	6563 Å	No Flare Patrol			s12e53		
1 – 12	keV	2227	2255	2312		M6.8	9.6E-2
50-100	keV	222232	224946	230716		35645838	HESSI
15.4	GHz	2241.0	2253.0	2312.0		3.40	
8.8	GHz	2239.0	2253.0	2316.0		3.53	
5	GHz	2238.0	2253.0	2318.0	U0.6 P5	3.57	
2.7	GHz	2239.0	2254.0	2322.0		3.32	
1.4	GHz	2238.0	2245.0	2322.0		2.80	
610	MHz	2239.0	2246.0	2329.0		2.71	
410	MHz	2239.0	2315.0	2334.0		2.79	
245	MHz	2243.0	2245.0	2334.0		3.08	
DS II		2248		2300	25-180	2	
DS II		2255		2256	45-55	3	
DS IV		2243		2336	60-2000	2	
DS III	B	2244		2244	18-180	3	
DS III	GG	2245		2259	20-800	2	
CME		2318	1825 km/s	-2.9 km/s ²	360°	117°	



PART 2. Event 2003.10.26 – (2003-299)

Particle event: To(Ep>10 MeV) – 26d18^h

Tmax₁(Ep>10 MeV) – 26d20^h, Jmax₁(Ep>10 MeV) – 230 /cm².s.sr

Tmax₂(Ep>10 MeV) – 27d02^h, Jmax₂(Ep>10 MeV) – 360 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 340 MeV

– Emax₂ = 400 MeV

Sources: ● solar flare 26d17^h21^m, X1.2/1N, N02W38 AR10484

∅ solar flare 27d09^h21^m, M5.0/SF, S15E26 AR10486

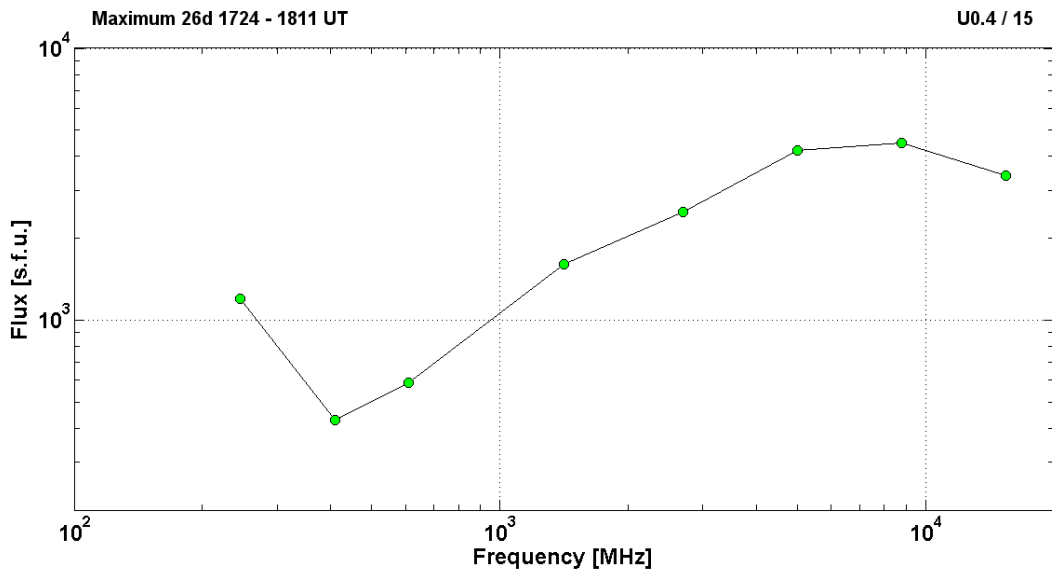
Main X-ray burst 1–8 Å: onset – 26^d17^h21^m, max – 26d18^h19^m, Φ = 0.63 J/m²

CME: 26d17^h54^m, V = 1754 km/s, Δφ = 171°, dA = 235°

▲ SC 26d19^h08^m; ▲ SC 28d19^h08^m

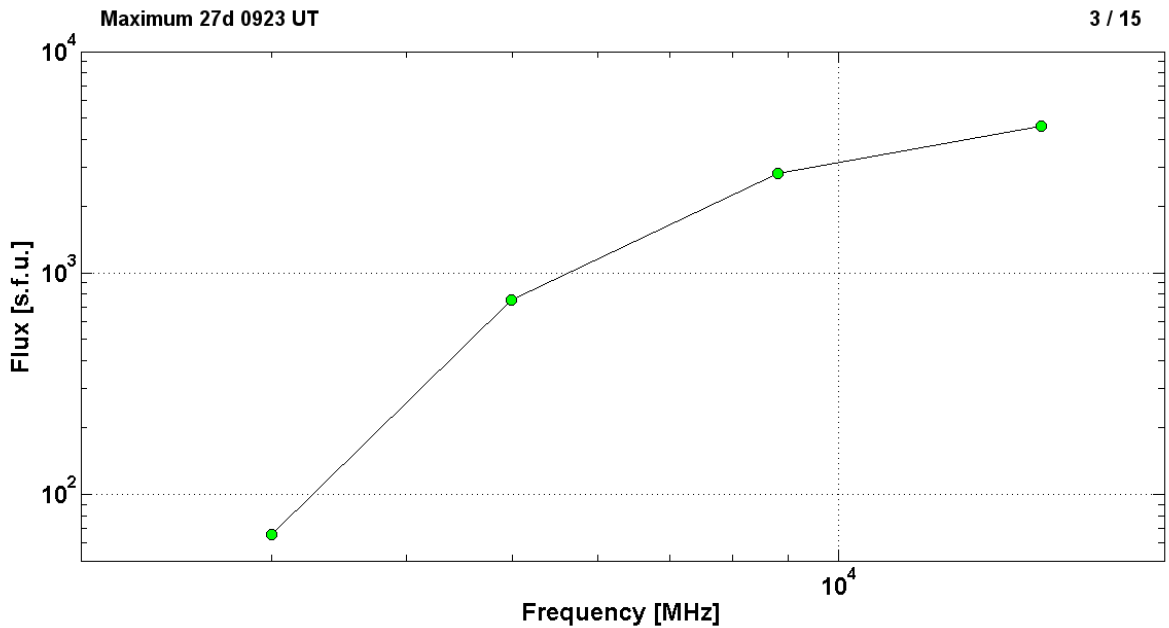
2003	October 26	●			AR10484	To event 439	
Hα	6563 Å	1721	1733	2016	N02W38	1N	F
1 – 12	keV	1721	1819	1921		X1.2	6.3E-1
15.4	GHz	1715.0	1731.0	1919.0	U0.4 / 15	3.53	
8.8	GHz	1715.0	1731.0	1908.0		3.65	
5	GHz	1712.0	1731.0	1920.0		3.62	
2.7	GHz	1715.0	1731.0	1920.0		3.40	
1.4	GHz	1718.0	1756.0	1820.0		3.20	
610	MHz	1720.0	1758.0	1826.0		2.77	
410	MHz	1720.0	1811.0	1849.0		2.63	
245	MHz	1722.0	1724.0	1908.0		3.08	
DS II		1735		1743	25-100	2	
DS CONT		1804		1853	30-45	1	
CME		1754	1537 km/s	4.8km/s ²	171°	235°	

HESSI - gap



2003 **October 26** ● **AR10486** **To event 439**

H α	6563 Å	0923	0925	0946	S15E26	SF	F
1 - 12	keV	0921	0927	0932		M5.0	2.6E-2
15.4	GHz	0922.0	0923.0	0931.0	3 / 15	3.66	
8.8	GHz	0905.0	0923.0	0938.0		3.45	
5	GHz	0922.0	0923.0	0927.0		2.88	
3	GHz	0922.9	0923.6	0926.2		1.82	
DS III	G,C	0922		0923	25-155	2	
DS DCIM	C	0917		0926	800-4000	3	



PART 2. Event 2003.10.28 – (2003-301) – GLE-65

Particle event: To(Ep>10 MeV) – 28d12^h

Tmax₁(Ep>10 MeV) – 28d18^h, Jmax₁(Ep>10 MeV) – 4.6·10³/cm².s.sr

Tmax₂(Ep>10 MeV) – 29d02^h, Jmax₂(Ep>10 MeV) – 1.2·10⁴/cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax₁ = 3350 MeV

– Emax₂ = 1050 MeV

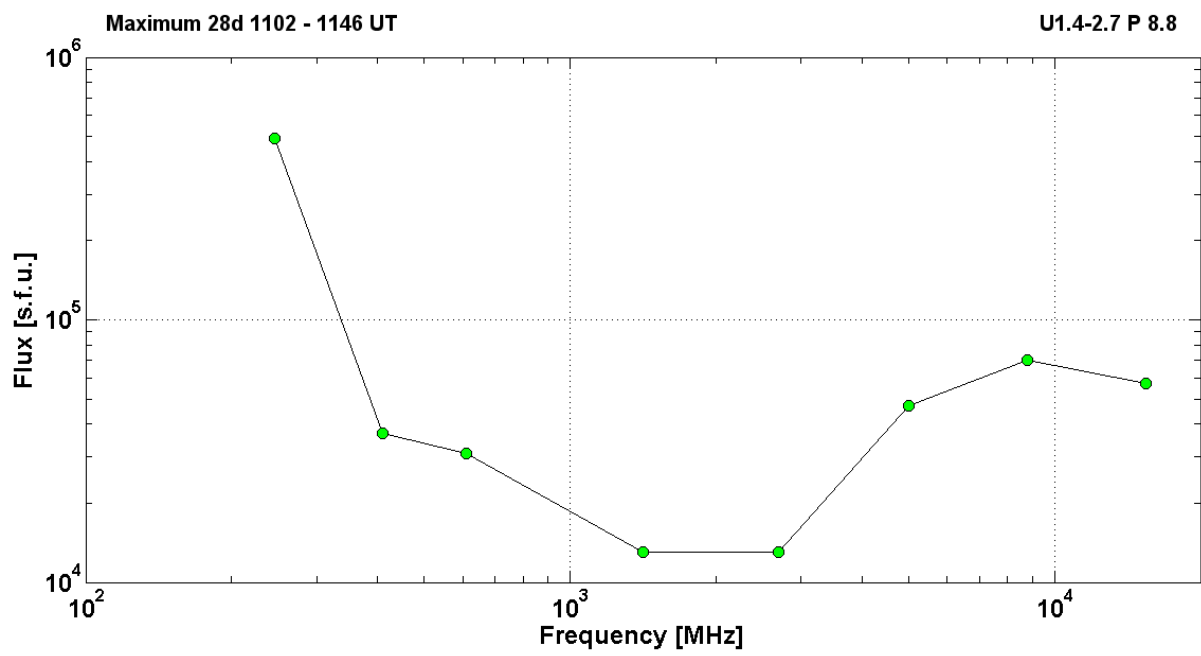
Sources • solar flare 28d09^h51^m, X17.2/4B, S16E08 AR10486

Main X-ray burst 1–8 Å: onset – 28d09^h51^m, max – 28d11^h10^m, Φ = 1.8 J/m²

CME: 28d11^h30^m, V=2459 km/s, Δφ = 360°, dA = 015°

▲ SC 29d06^h11^m

2003	October 28	•	AR10486	To event 440			
Hα	6563 Å	<1001	~1205	>1420	S16E08	4B	FU
1 – 12	keV	0951	1110	1124		X17.2	1.8E00
25-50	keV	094016	095322	095400		271440	HESSI
25-50	keV	102832	103530	103700		14146876	HESSI
800-7000	keV	103700	111410	113012		14146876	HESSI
50–150	keV	1102		1113		CORONAS-F	
60–100	MeV		>1103			CORONAS-F	
15.4	GHz	1004.0	1104.0	1456.0		4.76	
8.8	GHz	1003.0	1107.0	1456.0	U1.4-2.7 P 8.8	4.85	
5	GHz	1004.0	1112.0	1448.0		4.67	
2.7	GHz	1014.0	1114.0	1459.0		4.11	
1.4	GHz	1131.0	1146.0	0000.0		4.11	
610	MHz	1014.0	1117.0	1508.0		4.49	
410	MHz	1005.0	1104.0	1508.0		4.57	
245	MHz	1015.0	1102.0	1508.0		5.69	
DS II		1100		1129	100-1400	3	
DS II		1102		1111	25-180	3	
DS IV	P,C,F,S	1012		1515	100-4000	3	
DS IV		1033		1531	25-180	3	
DS III	GG,C	0949		0955	400-4000	3	
DS III	GG,FS	1013		1031	25-270	2	
DS III	GG,C	1058		1111	25-270	3	
DS CONT		~1030		>1224	50-270	3	
DS DCIM	GG	1005		1236	2000-4500	3	
DS DCIM	GG,SP,FS	1058		1336	800-2000	3	
n°						CORONAS-F	
n°			1103, 1040			Tsumed, (S, A, T)	
CME		1130	2459 km/s	-105.2 km/s ²	360°	015°	1130



PART 2. Event 2003.10.29 – (2003-302) – GLE-66

Particle event: To(Ep>10 MeV) – 29d22^h

Tmax(Ep>10 MeV) – 29d23^h, Jmax(Ep>10 MeV) – 2230 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 820 MeV

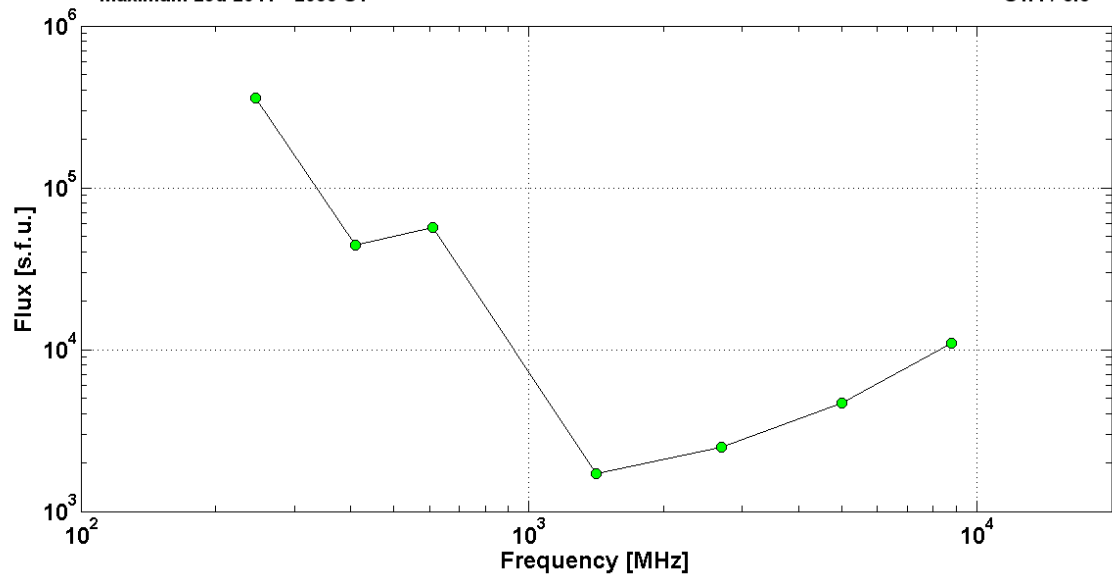
Sources: ● solar flare 29d20^h37^m, X10.0/2B, S15W02, AR10486

Main X-ray burst 1–8 Å: onset – 29d20^h37^m, max – 29d20^h49^m, Φ = 0.87 J/m²

CME: 29d20^h54^m, V = 2459 km/s, Δφ = 360°, dA = 190°

▲ SC 29d06^h11^m

2003	October 29	●	AR10486	To event 441			
Hα	6563 Å	2037	2042	2253	S15W02	2B	UZ
1 – 12	keV	2037	2049	2101		X10.0	8.7E-1
100–300	keV	203556	2048:4	210824		247490912	HESSI
50–150	keV	2038		2055		CORONAS-F	
4–7	MeV		>1103			CORONAS-F	
8.8	GHz	2039.0	2043.0	2052.0	U1.4 / 8.8	4.04	
5	GHz	2039.0	2043.0	2053.0		3.67	
2.7	GHz	2039.0	2041.0	0000.0		3.40	
1.4	GHz	2039.0	2043.0	2057.0		3.23	
610	MHz	2040.0	2054.0	2059.0		4.76	
410	MHz	2041.0	2055.0	2059.0		4.64	
245	MHz	2042.0	2042.0	0000.0		5.56	
DS II	FN	2042		~2050	60-430	3	
DS II		2044		2053	25-180	3	
DS IV		2057		2220	25-1200	3	
DS III	G	2042		2044	18-380	3	
DS III	GG	2049		2100	120-1200	3	
CME		2054	2029 km/s	-146.5.2 km/s ²	360°	190°	



PART 2. Event 2003.11.02 – (2003-306) – GLE-67

Particle event: To(Ep>10 MeV) – 02d17^h

Tmax(Ep>10 MeV) – 02d23^h, Jmax (Ep>10 MeV) – 990 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 1450 MeV

Sources: ● solar flare 02d17^h03^m, X8.3/2B, S14W56, AR10486

∅ solar flare 01d22^h26^m, M3.2/1N, S12W60, AR10486 *

∅ solar flare 03d01^h06^m, 2B/X2.3, N10W83, AR10488

Main X-ray burst 1–8 Å: onset – 02d17^h03^m, max – 02d17^h25^m, Φ = 0.91 J/m²

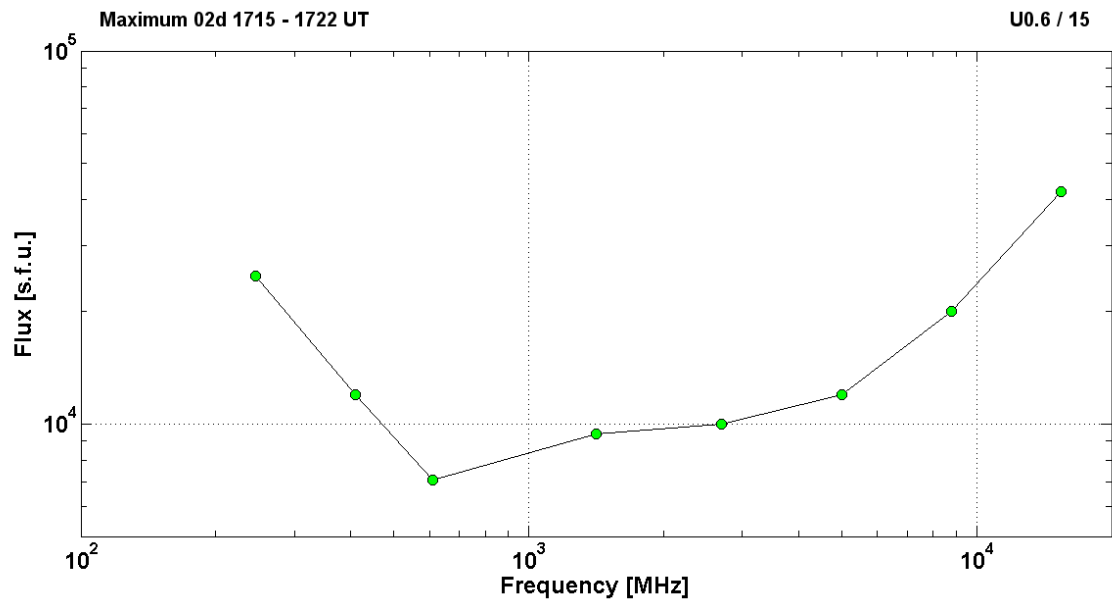
CME: 02d17^h30^m, V = 2598 km/s, Δφ = 360°, dA = 265°

▲ SC: 04d06^h25^m

* - Contribution of event beginning

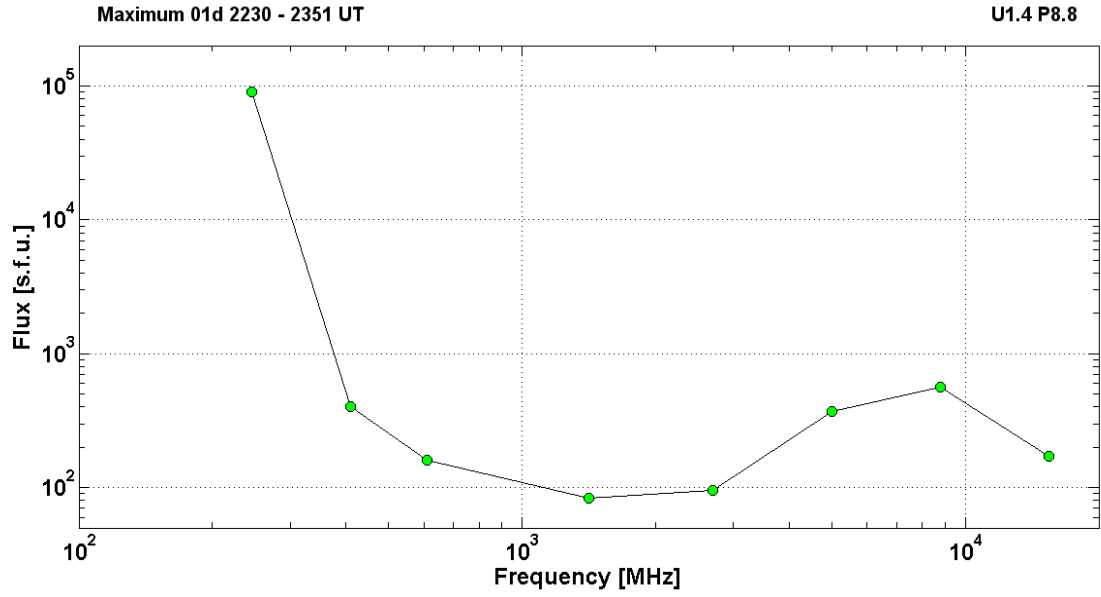
2003 November 02 ● AR10486 To event 442

Hα	6563 Å	1704	1717	1954	S14W56	2B	UZ
1 – 12	keV	1703	1725	1739		X8.3	9.1E-1
800-7000	keV	170916	172246	173028		434251584	HESSI
6-12	keV	173028	174230	174436		5220713	HESSI
15.4	GHz	1703.0	1719.0	1830.0	U0.6 / 15	4.62	
8.8	GHz	1704.0	1721.0	1818.0		4.30	
5	GHz	1703.0	1722.0	1803.0		4.08	
2.7	GHz	1703.0	1717.0	1758.0		4.00	
1.4	GHz	1711.0	1720.0	1836.0		3.97	
610	MHz	1712.0	1718.0	1836.0		3.85	
410	MHz	1711.0	1715.0	1836.0		4.08	
245	MHz	1714.0	1715.0	1835.0		4.40	
DS II		1714		1737	25-180	3	
DS IV		1714		1824	30-80	3	
DS III	N	1714		1800	25-180	2	
°n							Bolivia
CME		1730	2598 km/s	-32.4 km/s ²	360°	265°	



2003	November 01	Ø	AR10486	To event 442			
H α	6563 Å	2228	2234	2312	S12W60	1N	FU
1 – 12	keV	2226	2238	2249		M3.2	2.8E-2
50-100	keV	222456	223426	224812		14352336	HESSI
15.4	GHz	2229.0	2233.0	2242.0		2.23	
8.8	GHz	2228.0	2230.0	2242.0	U1.4 P8.8	2.75	
5	GHz	2229.0	2230.0	2239.0		2.57	
2.7	GHz	2230.0	2232.0	2234.0		1.98	
1.4	GHz	2348.0	2348.0	~2348.0		1.92	
610	MHz	2345.0	2351.0	2354.0		2.20	
410	MHz	2237.0	2237.0	2242.0		2.60	
245	MHz	2234.0	2235.0	2240.0		4.95	
DS II		2224		2257	25-290	3	
DS II	UE	2248		2302	20-45	3	
DS II		2336		2255	25-180	1	
DS IV		2243		2333	70-150	2	
DS III	G	2234		2235	18-330	3	
DS III	S,C	2239		>2400	20-200	2	
DS CONT		2345		2356	200-750	1	
DS UNCLF		2237		2240	180-430	1	
DS UNCLF		2307		2313	18-30	3	

CME		2306	0899km/s	-26.3km/s ²	360°	224°	
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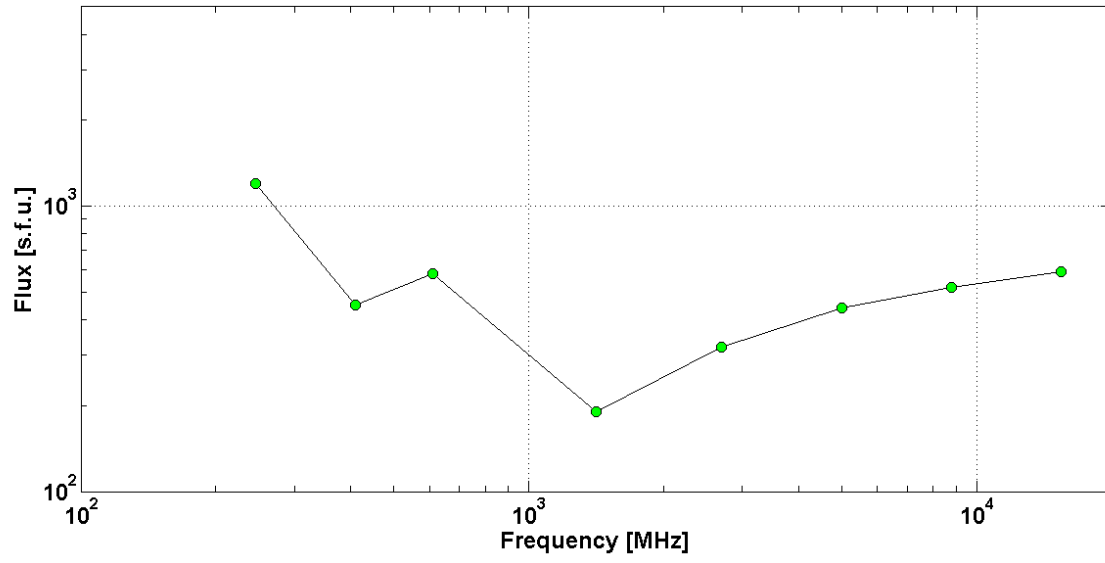


2003	November 03	∅	AR10488	To event 442			
H α	6563 Å	0106	0131	0237	N10W83	2B	EF
1 – 12	keV	0109	0130	0145		X2.7	3.6E-1
25-50	keV	010120	012526	020128		354025280	HESSI
6-12	keV	023744	023746	023828		64704	HESSI
50–150	keV	01:17		01:29		CORONAS-F SONG	
0.5–1.3	MeV		>0117			CORONAS-F SONG	
15.4	GHz	0101.0	0121.0	0202.0	U1.4 / 15	2.77	
8.8	GHz	0101.0	0121.0	0147.0		2.72	
5	GHz	0059.0	0121.0	0149.0		2.64	
2.7	GHz	0103.0	0121.0	0134.0		2.51	
1.4	GHz	0101.0	0103.0	0126.0		2.28	
610	MHz	0059.0	0122.0	0151.0		2.76	
410	MHz	0117.0	0148.0	0148.0		2.65	
245	MHz	0105.0	0105.0	0201.0		3.08	
DS II	SH	0124		0129	50-200	3	
DS IV		0108		0136	20-850	1	
DS IV		0131		0406	25-115	1	
DS III	G	0108		0118	18-340	3	
DS III	S,C	0133		0226	18-250	3	
n°						Mauna Kea, Haleakala	

CME		0159	0827 km/s	-28.3 km/s ²	065°	324°	

Maximum 03d 0103 - 0148 UT

U1.4 / 15



PART 2. Event 2003.11.04 – (2003-308)

Particle event: To(Ep>10 MeV) – 04d22^h

Tmax(Ep>10 MeV) – 05d07^h, Jmax (Ep>10 MeV) – 126 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax = 450 MeV

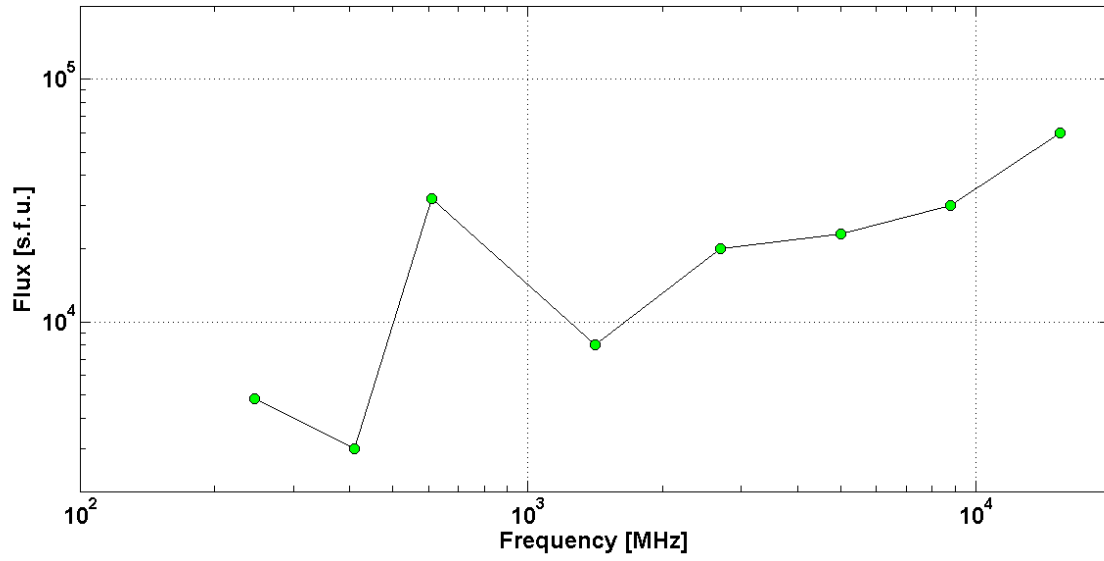
Sources: • solar flare 04d19^h29^m, X>17.5/3B, S19W83, AR10486

Ø solar flare 05d10^h46^m, M5.3/SF, S16W90, AR10486

Main X-ray burst 1-8 Å: onset – 04d19^h29^m, max – 04d19^h50^m, Φ = 2.3 J/m²

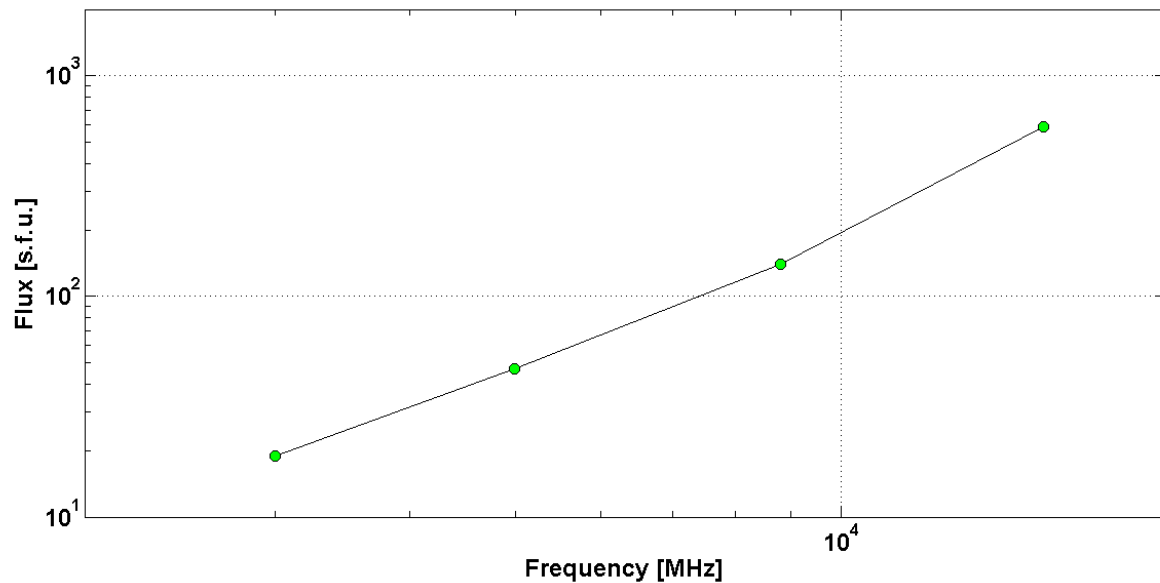
CME: 04d19^h54^m, V = 2657 km/s, Δφ = 360°, dA = 260°

2003	November 04	• AR10486				To event 443	
Hα	6563 Å	1932	1957	2049	S19W83	3B	FZ
1 – 12	keV	1929	1950	2006		X>17.5	2.3E00
50-100	keV	192816	193822	193916		3265828	HESSI
25-50	keV	201512	201602	202156		7718513	HESSI
6-12	keV	202156	202354	203100		9181674	HESSI
25-50	keV	203228	203438	204028		6256194	HESSI
6-12	keV	204028	204202	204500		3023174	HESSI
12-25	keV	204500	204742	211520		12714261	HESSI
50–150	keV	1932		1957		CORONAS-F	
100–200	MeV					CORONAS-F	
15.4	GHz	1933.0	1945.0	2121.0	/ 15	4.78	
8.8	GHz	1933.0	1946.0	2058.0		4.48	
5	GHz	1933.0	1945.0	2113.0		4.36	
2.7	GHz	1933.0	1946.0	2116.0		4.30	
1.4	GHz	1933.0	1944.0	2102.0		3.90	
610	MHz	1933.0	1944.0	2101.0		4.51	
410	MHz	<1933.0	1942.0	>1943.0		3.48	
245	MHz	1932.0	1941.0	2000.0		3.68	
DS II		1943		1947	30-80	3	
DS II	UE	<2000		2006	23-170	3	
DS II	FN	2003		2008	20-45	3	
DS IV		1947		2017	25-180	2	
DS III	G	2002		2013	23-57	3	
DS III	G	2047		2056	20-45	3	
°n						Mauna Kea Haleakala	
CME		1954	2657 km/s	434.8 km/s ²	360°	260°	



2003 November 05 \emptyset AR10486 To event 443

H α	6563 Å	1051	1051	1058	S16W90	SF	
1 - 12	keV	1046	1052	1056		M5.3	1.7E-02
15.4	GHz	1049.0	1049.0	1050.0	3 / 15	2.77	
8.8	GHz	<1050.0	~1050.0	>1050.0		2.15	
5	GHz	<1050.0	~1050.0	>1050.0		1.67	
3	GHz	1049.4	1049.6	1050.4		1.28	
DS DCIM	C	1049		1050	2000-4000	2	



PART 2. Event 2003.11.20 – (2003-324)

Particle event: To(Ep>10 MeV) – 20d08^h

Tmax(Ep>10 MeV) – 20d11^h, Jmax (Ep>10 MeV) – 4.4 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 140 MeV

Sources: • solar flare 20d07^h35^m, M9.6/2B, N01W08, AR10501

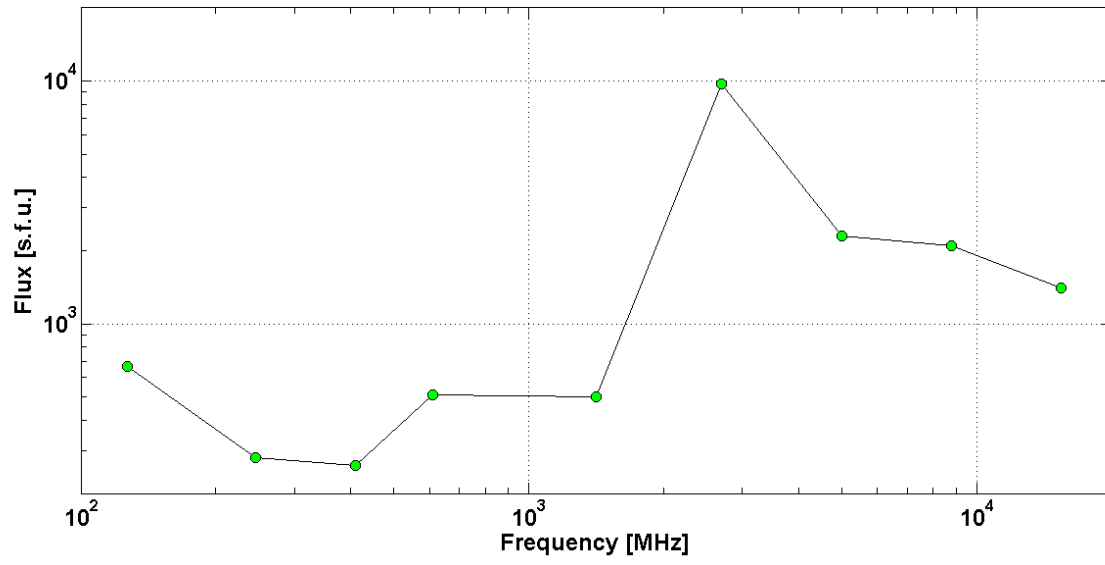
Main X-ray burst 1–8 Å: onset – 20d07^h35^m, max – 20d07^h47^m, Φ = 0.06 J/m²

CME: 20d08^h06^m, V = 669 km/s, Δφ = 360°, dA = 219°

▲ SC: 20d08^h03^m

2003 November 20 • AR10501 To event 444

Hα	6563Å	0738	0740	0836	N01W08	2B	FH
1 – 12	keV	0735	0747	0753		M9.6	6.0E-2
12-25	keV	071104	071254	071624		82992	HESSI
12-25	keV	080008	080050	082704		335064	HESSI
12-25	keV	082704	082842	082842		19262	HESSI
50–150	keV	0803		0816		CORONAS-F	
0.5–1.3	MeV					CORONAS-F	
15.4	GHz	0738.0	0740.0	0753.0		3.15	
8.8	GHz	0737.0	0740.0	0757.0		3.32	
5	GHz	0737.0	0739.0	0754.0		3.36	
2.7	GHz	0736.0	0739.0	0749.0	[U0.6] P2.7	3.99	
1.4	GHz	0737.0	0739.0	0744.0		2.70	
610	MHz	0735.0	0740.0	0742.0		2.71	
410	MHz	0735.0	0743.0	0745.0		2.41	
245	MHz	0738.0	0739.0	0745.0		2.45	
127	MHz	0735.7	0739.7	0744.0		2.83	
DS IV		0741		0900	25-113	1	
DS I	GG,DC	0739		0743	50-270	2	
DS I	S,N	~0758		~1442	200-400	2	
DS III	G	0736		0743	18-700	3	
DS III	N	0748		1506	25-180	2	
DS III	GG,N	<0752		~0843	40-400	2	
DS V		0738		0741	25-180	3	
DS CONT		0738		~0744	25-270	2	
CME		0806	0669 km/s	-23.8km/s ²	360°	219°	



PART 2. Event 2003.11.21 – (2003-325)

Particle event: To(Ep>10 MeV) – 21d08^h

Tmax(Ep>10 MeV) – 22d02^h, Jmax (Ep>10 MeV) – 10.7 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax = 80 MeV

Sources: • solar flare 20d23^h42^m, M5.8/2B, N02W17, AR10501

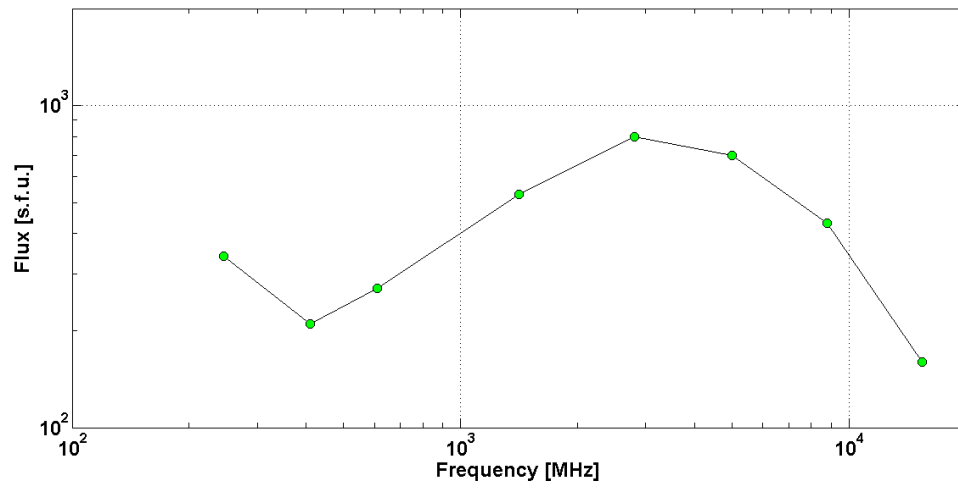
Main X-ray burst 1–8 Å: onset – 20d23^h42^m, max – 20d23^h53^m, Φ = 0.028 J/m²

CME: 21d00^h26^m; V = 494 km/s; Δφ = 052°; dA = 237°

2003	November 21	•	AR10501	To event 445			
Hα	6563 Å	2346	2354	0031	N02W17	2B	F
1 – 12	keV	2342	2353	2358		M5.8	2.8E-02
6–12	keV	235628	235754	000248		35568	HESSI
6–12	keV	000852	000918	001024		5400	HESSI
6–12	keV	002024	002514	003420		89832	HESSI
12-25	keV	003420	004854	005416		530784	HESSI
15.4	GHz	2352.0	2353.0	2354.0		2.20	
8.8	GHz	2346.0	2348.0	2355.0		2.63	
5	GHz	2346.0	2348.0	0000.0		2.85	
2.8	GHz	2345.0	2349.0	2357.0	U0.4 P2.8	2.90	
1.4	GHz	2346.0	2349.0	2352.0		2.72	
610	MHz	2346.0	2347.0	2351.0		2.43	
410	MHz	2348.0	2348.0	0000.0		2.32	
245	MHz	2345.0	2348.0	0000.0		2.53	
DS III	G	2347		2351	18-1400	3	
DS III	G	2352		2354	18-420	3	
DS III	B	2356		2356	18-50	3	
DS III	N	2356		0248	25-180	1	
DS III	G	0025		0030	18-1000	3	
CME		0026	0494 km/s	-3.3 km/s ²	052°	237°	

Maximum 20d 2347 - 2353 UT

U0.4 P2.8



PART 2. Event 2003.12.02 – (2003-336)

Particle event: To(Ep>10 MeV) – 02d12^h

Tmax(Ep>10 MeV) – 02d18^h, Jmax (Ep>10 MeV) – 21 /cm².s.sr

Duration of the event – 4.5 days

Maximum recorded proton energy of the event – Emax = 100 MeV

Sources: ☉ solar flare 02d09^h40^m, C7.2/..., s19w90, AR10508*

Main X-ray burst 1–8 Å: onset – 02d09^h40^m, max – 02d09^h48^m, Φ = 0.0051 J/m²

CME: 02d10^h50^m, V = 1393 km/s, Δφ = 150°, dA = 267°

* – probable localization of the flare event

2003	December 02	☉			AR10508	To event 446	
Hα	6563 Å	No Flare			s19w90		
1 – 12	keV	0940	0948	0954		C7.2	5.1E-3
12-25	keV	094524	094602	100316		412771	HESSI
9.1	GHz	0942.9	0943.6	0945.0		1.11	
3	GHz	0943.0	0943.9	0944.9		1.72	
245	MHz	0943.0	0943.0	~0943.0		1.93	
DS I	GG,DC	0943		0944	170-270	2	
DS III	GG	0943		0944	180-300	1	
DS DCIM	G	0936		0944	2098-4500	1	
CME		1050	1393 km/s	18.5 km/s ²	150°	267°	

PART 2. Event 2004.04.11 – (2004-102)

Particle event: To(Ep>10MeV) – 11d06^h

Tmax₁(Ep>10MeV) – 11d12^h, Jmax₁(Ep>10MeV) – 13 /cm².s.sr

Tmax₂(Ep>10MeV) – 11d20^h, Jmax₂(Ep>10MeV) – 14.5 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 100 MeV

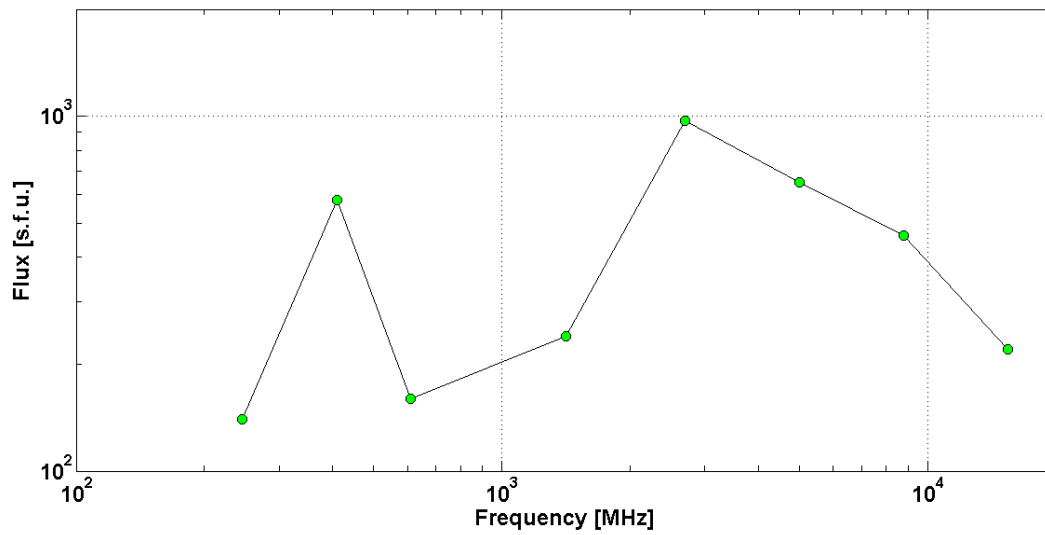
– Emax₂ = 80 MeV

Sources: • solar flare 11d03^h54^m, C9.6/1F, S14W47, AR10588

Main X-ray burst 1–8 Å : onset – 11d03^h54^m, max – 11d04^h19^m, Φ = 0.013 J/m²

CME: 11d04^h30^m, V = 1645 km/s, Δφ = 314°, dA = 237°

2004	April 11	•	AR10588			To event 447	
Hα	6562 Å	0400	0421	0451	S14W47	1F	EF
1 – 12	keV	0354	0419	0435		C9.6	1.3E-2
50-100	keV	040632	041542	044344		937728	HESSI
50-150	keV	0413		0418		CORONAS-F	
150-500	keV					CORONAS-F	
0.18-0.7	MeV					CORONAS-F	
15.4	GHz	0412.0	0415.0	0428.0		2.34	
8.8	GHz	0411.0	0415.0	0000.0		2.66	
5	GHz	0411.0	0416.0	0425.0		2.81	
2.7	GHz	0410.0	0415.0	0424.0	[U0.6] P2.7	2.99	
1.4	GHz	0407.0	0407.0	0000.0		2.38	
610	MHz	0400.0	0402.0	0404.0		2.20	
410	MHz	0411.0	0413.0	0415.0		2.76	
245	MHz	0408.0	0410.0	0411.0		2.15	
DS III	GG	0358		0425	18-700	3	
DSF	Hα	~0307		0400	S18W50	16°	
CME		0430	1645 km/s	-77.6 km/s ²	314°	237°	



PART 2. Event 2004.07.22 – (2003-204)

Particle event: To(Ep>10MeV) – 22d17^h

Tmax₁(Ep>10MeV) – 22d20^h, Jmax₁(Ep>10MeV) – 0.9 /cm².s.sr

Tmax₂(Ep>10MeV) – 23d10^h, Jmax₂(Ep>10MeV) – 2 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax₁ = 70 MeV

– Emax₂ = 160 MeV

Sources: ☉ solar flare 22d00^h14^m, M9.1/ , n06e25, AR10652*

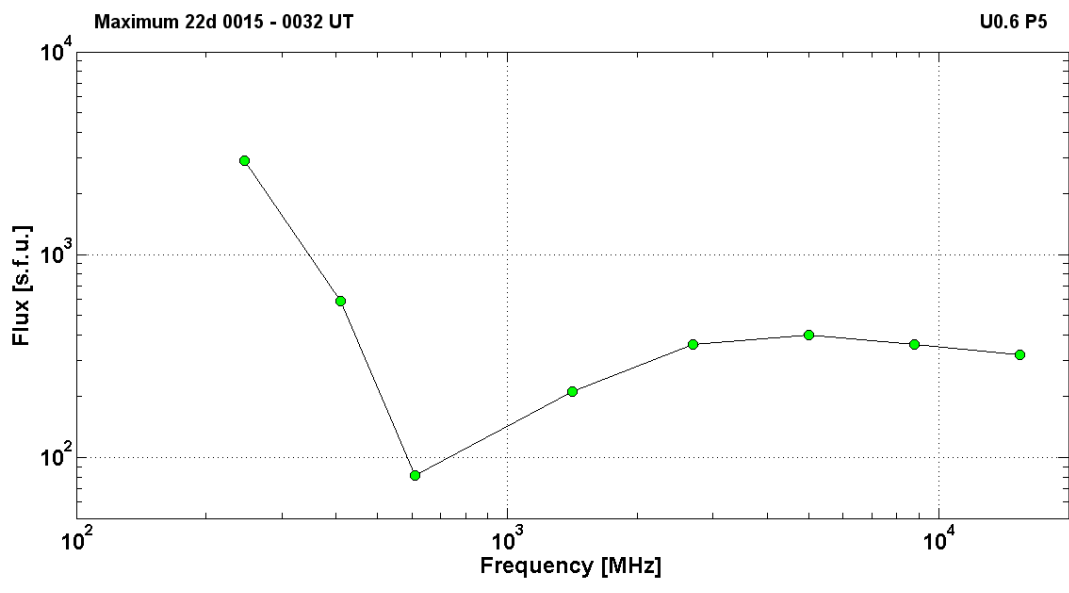
Main X-ray burst 1–8 Å: onset – 22d00^h14^m, max – 22d00^h32^m, Φ = 0.079 J/m²

CME: 22d01^h32^m, V = 0492 km/s, Δφ = 083°, dA = 180°

▲ SC 24d06^h13^m

* – probable localization of the flare event

2004 July 22		• AR10652				To event 448	
Hα	6563 Å	No Flare Patrol			n06e25		
1 – 12	keV	0014	0032	0043		M9.1	7.9E-2
25-50	keV	235256	002958	005528		46462728	HESSI
15.4	GHz	0017.0	0031.0	0126.0		2.51	
8.8	GHz	0018.0	0031.0	0124.0		2.56	
5	GHz	0015.0	0027.0	0109.0	U0.6 P5	2.60	
2.7	GHz	0021.0	0027.0	0109.0		2.56	
1.4	GHz	0024.0	0026.0	0031.0		2.32	
610	MHz	0032.0	0032.0	0123.0		1.91	
410	MHz	0015.0	0015.0	0016.0		2.77	
245	MHz	0030.0	0031.0	0031.0		3.46	
DS III	S,C	<0000		>0710	18-200	3	
DS III	N	0015		0131	100-1000	1	
CME		0132	0492 km/s	0.3 km/s ²	083°	180°	



PART 2. Event 2004.07.23 – (2003-205)

Particle event: To(Ep>10MeV) – 23d16^h

Tmax(Ep>10MeV) – 23d19^h, Jmax(Ep>10MeV) – 1.8 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 80 MeV

Sources: ☉ solar flare 22d22^h 23^m, 2N/M1.6, N05E04 AR10652*

22d 23^h 10^m 2N/M1.2, N05E04 AR10652*

∅ solar flare 23d 17^h 07^m, M2.2/SF, N03W04 AR10652

Main x-ray burst 1–8 Å (12.4–1.55 keV): onset–22d22^h40^m, max–22d22^h58^m, Φ=0.016 Jo.m⁻²

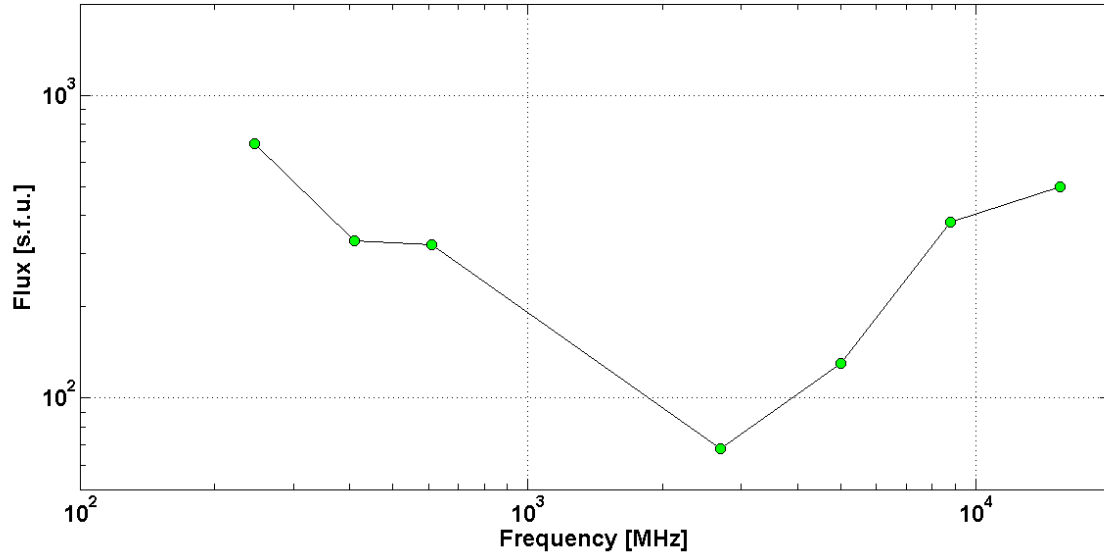
onset–22d23^h10^m, max–22d23^h24^m, Φ=0.023 Jo.m⁻²

CME:22d23^h 54^m; V = 0448 km/s; Δφ = 046°; dA = 200°

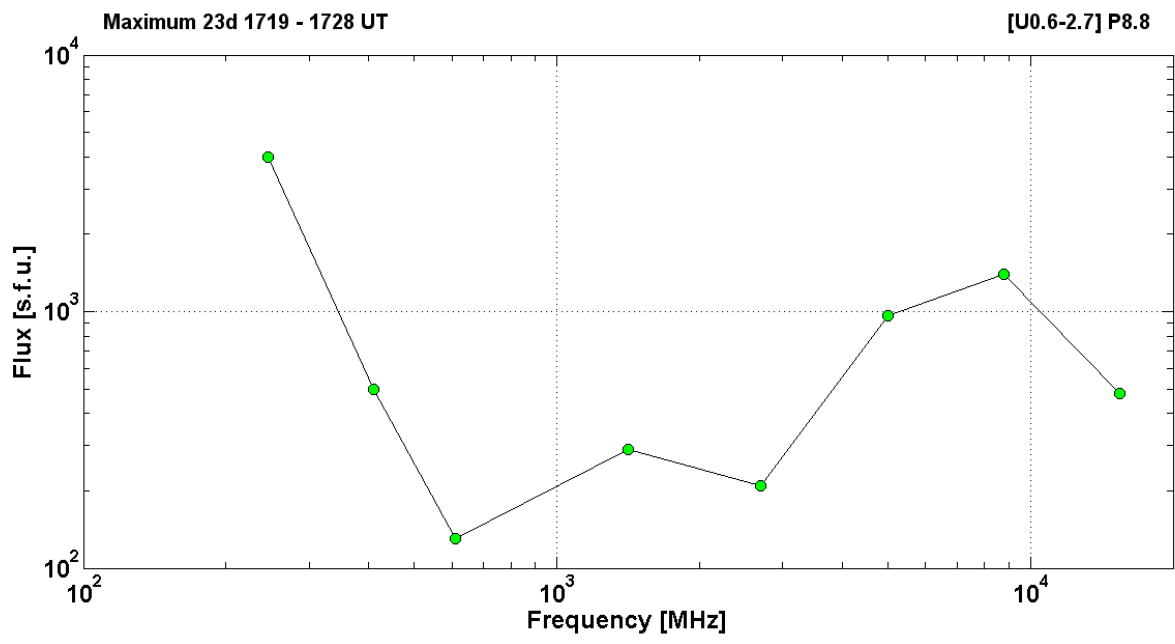
▲ SC 24^d 06^h 13^m

* – One solar flare event with two X-ray burst

2004	July 22	☉			AR10652	To event 449	
Hα	6563 Å	2223	2256	>2333	N05E04	2N	MZ
1 – 12	keV	2240	2258	2307		M1.6	1.6E-2
1 – 12	keV	2310	2324	2343		M1.2	2.3E-2
25-50	keV	223740	225450	230600		5664912	HESSI
25-50	keV	230600	231514	231916		3941621	
15.4	GHz	2246.0	2255.0	2317.0	U2.7 / 15	2.70	
8.8	GHz	2244.0	2255.0	2327.0		2.58	
5	GHz	2243.0	2255.0	2327.0		2.11	
2.7	GHz	2244.0	2247.0	2255.0		1.83	
610	MHz	2253.0	2254.0	2301.0		2.51	
410	MHz	2245.0	2255.0	2321.0		2.52	
245	MHz	2243.0	2302.0	2328.0		2.84	
DS III	GG	2253		2302	18-880	3	
DS CONT		2338		0919	25-180	2	
CME		2354	0448 km/s	-25.8km/s ²	046°	200°	



2004 July 23		ø			AR10652	To event 449	
H α	6563 Å	<1723	~1723	>1735	N03W04	SF	F
1 – 12	keV	1707	1728	1735		M2.2	1.5E-2
12-25	keV	172652	172726	175300		2487273	HESSI
15.4	GHz	1716.0	1720.0	0000.0		2.68	
8.8	GHz	1719.0	1720.0	0000.0	[U0.6-2.7] P8.8	3.15	
5	GHz	1717.0	1720.0	1733.0		2.98	
2.7	GHz	1718.0	1720.0	1733.0		2.32	
1.4	GHz	1719.0	1720.0	1729.0		2.46	
610	MHz	1718.0	1719.0	1721.0		2.11	
410	MHz	1718.0	1728.0	1728.0		2.70	
245	MHz	1716.0	1720.0	0000.0		3.60	
DS III		1710		1711	25-180	2	
DS III	N	1716		1732	25-180	2	
DS DCIM	P,C	1710		1737	100-4000	3	
CME		1754	0569 km/s	-8.1 km/s ²	142°	256°	



PART 2. Event 2004.07.25 – (2004-207)

Particle event: To(Ep>10MeV) – 25d17^h

Tmax₁(Ep>10MeV) – 25d21^h, Jmax₁(Ep>10MeV) – 27 /cm².s.sr

Tmax₂(Ep>10MeV) – 26d23^h, Jmax₂(Ep>10MeV) – 430 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax₁ = 140 MeV

– Emax₂ = 155 MeV

Sources: ● solar flare 25d14^h19^m, M1.1/1F, N08W33, AR10652

○ solar flare 26d17^h23^m, M1.1/2N, N03W45, AR10652

Main X-ray burst 1–8 Å: onset – 25d14^h19^m, max – 25d15^h14^m, Φ = 0.065 J/m²

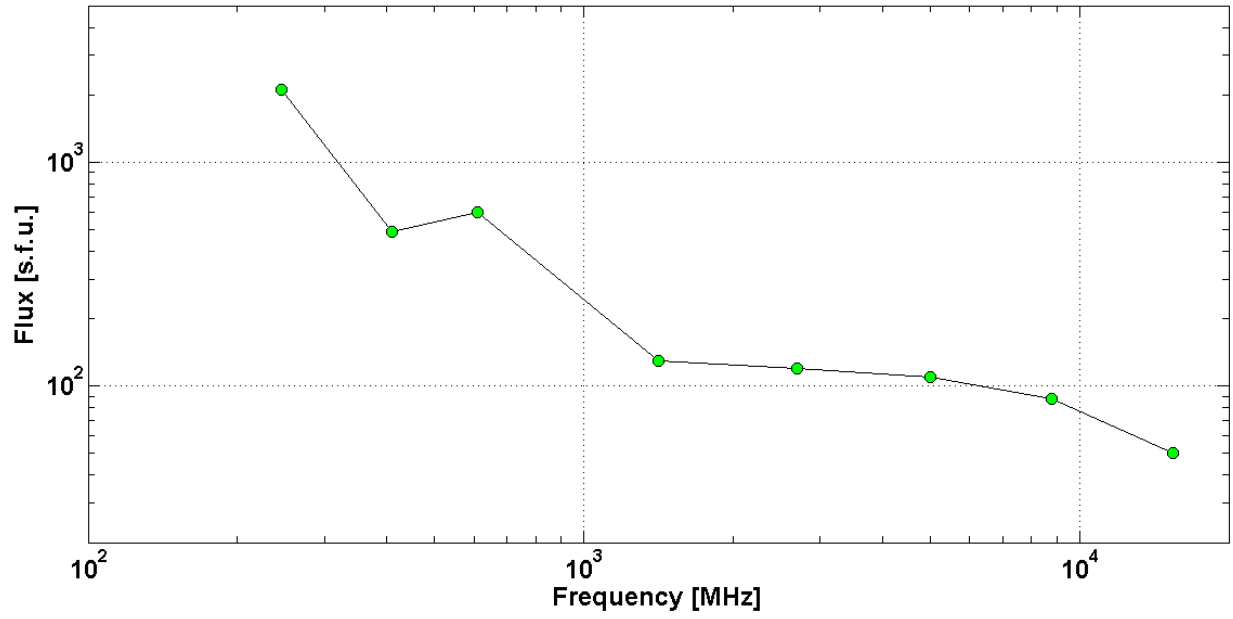
CME: 25d14^h54^m, V = 1333 km/s, Δφ = 360°, dA = 204°

▲ SC 26d22^h49^m;

2004	July 25	●			AR10652	To event 450	
Hα	6563 Å	1433	1448	1643	N08W33	1F	F
1 – 12	keV	1419	1514	1643		M1.1	6.5E-02
12-25	keV	142940	145046	145220		76350	HESSI
6-12	keV	145220	145834	150504		646080	HESSI
6-12	keV	150504	150750	151800		589305	HESSI
6-12	keV	163112	163138	165420		146113	HESSI
15.4	GHz	1447.0	1521.0	1603.0		1.70	
8.8	GHz	1441.0	1519.0	1647.0		1.94	
5	GHz	1441.0	1543.0	1634.0		2.04	
2.7	GHz	1424.0	1506.0	1603.0		2.08	
1.4	GHz	1434.0	1509.0	1603.0		2.11	
610	MHz	1424.0	1521.0	1606.0		2.78	
410	MHz	1424.0	1505.0	1551.0		2.69	
245	MHz	1424.0	1520.0	1534.0	U2.4 \ P15	3.32	
DS II		1521		1526	25-81	1	
DS IV		1415		1731	25-180	2	
DS DCIM	GG	1421		1518	2000-4500	2	
DS DCIM	GG	1434		1543	800-2000	2	
DS DCIM	C	1503		1530	390-3000	3	
8.8	GHz	1641.0	1641.0	~1641.0		1.89	
5	GHz	1637.0	1641.0	1646.0		2.18	
2.7	GHz	1638.0	1639.0	1646.0	P2.7	2.23	
1.4	GHz	1641.0	1642.0	1643.0		1.96	
CME		1454	1333 km/s	7.0 km/s ²	360°	204°	

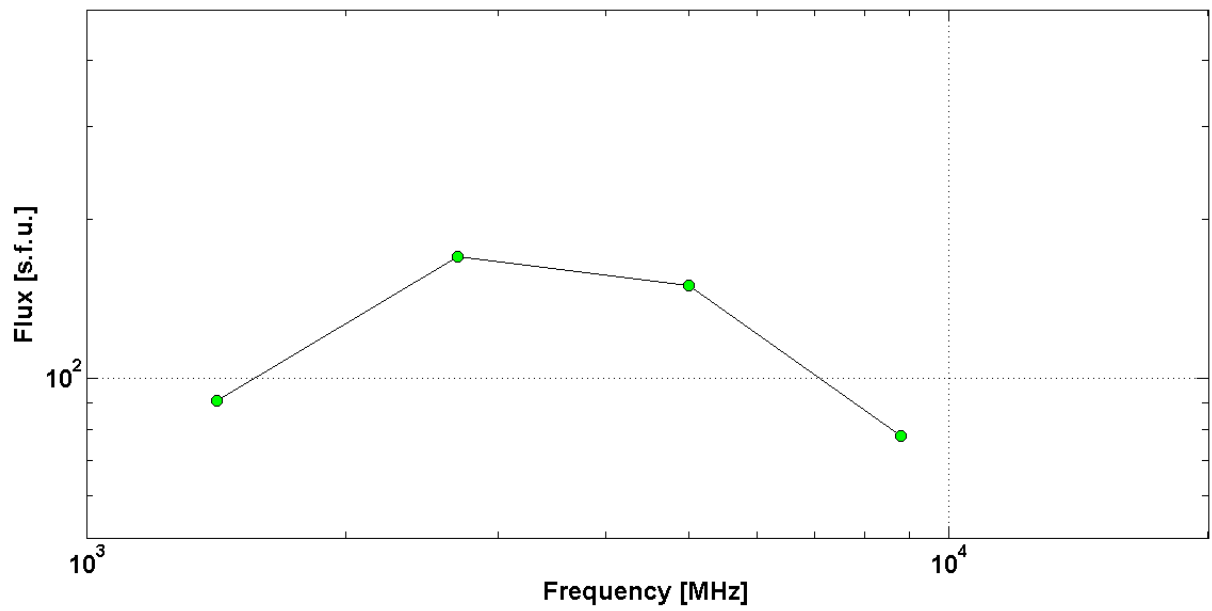
Maximum 25d 1505 - 1543 UT

U2.4 \ P15



Maximum 25d 1639 - 1642 UT

P2.7



2004	July 26	Ø			AR10652	To event 450	
H α	6563 Å	1726	1736	1752	N03W45	2N	EF
1 – 12	keV	1723	1730	1737		M1.1	6.3E-3
25-50	keV	172828	173046	173316		329366	HESSI
15.4	GHz	1730.0	1730.0	~1730.0		1.86	
8.8	GHz	1726.0	1730.0	1731.0	U1.4 U8.8	2.28	
5	GHz	1726.0	1728.0	1731.0		2.08	
2.7	GHz	1727.0	1728.0	1729.0		1.58	
1.4	GHz	1726.0	1730.0	1730.0		1.41	
610	MHz	1725.0	1725.0	1729.0		1.60	
410	MHz	1725.0	1725.0	1729.0		2.04	
DS III	GG,RS,C	1723		1730	250-4000	3	
DS DCIM	GG	1725		1730	800-2000	1	
DSF	H α	~1652		~1407	N16W50	12°	
CME		1830	0401 km/s	39.5 km/s ²	058°	221°	

PART 2. Event 2004.08.01 – (2004-214)

Particle event: To(Ep>10MeV) – 01d01^h

Tmax₁(Ep>10MeV) – 01d21^h, Jmax₁(Ep>10MeV) – 5.2 /cm².s.sr

Tmax₂(Ep>10MeV) – 02d02^h, Jmax₂(Ep>10MeV) – 4.8 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 80 MeV

– Emax₂ = 75 MeV

Sources: □ Flare activity AR10652 >1,5d behind W-limb

▣ solar flare 31d05^h16^m, C8.4/..., n02w90, AR10652*

∅ solar flare 31d10^h35^m, C5.3/..., n02w90, AR 10652*

Main X-ray burst 1–8 Å: onset – 31d05^h16^m, max – 31d06^h57^m, Φ = 0.076 J/m²

CME: 31d05^h54^m: V=1192 km/s, Δφ = 259°, dA= 287°

* – probable localization of the flare event

2004	July 31	▣			AR10652	To event 451	
Hα	6563 Å	No Flare			n02w90		
1 – 12	keV	0516	0657	0914		C8.4	7.6E-2
6-12	keV	063024	063458	063916		362241	HESSI
12-25	keV	063916	064334	071552		1405027	HESSI
6-12	keV	084648	084658	085232		44076	HESSI
CME		0554	1192 km/s	46.4 km/s ²	197°	287°	

2004	July 31	∅			AR10652	To event 451	
Hα	6563 Å	No Flare			n02w90		
1 – 12	keV	1035	1101	1149		C5.3	2.1E-2
6-12	keV	11:45:44	11:45:46	12:00:44		57313	HESSI

PART 2. Event 2004.09.13 – (2004-257)

Particle event: To(Ep>10MeV) – 13d19^h

Tmax₁(Ep>10MeV) – 13d23^h, Jmax₁(Ep>10MeV) – 210 /cm².s.sr

Tmax₂(Ep>10MeV) – 14d05^h, Jmax₂(Ep>10MeV) – 180 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax₁ = 110 MeV

– Emax₂ = 90 MeV

Sources: ☉ solar flare 12d00^h04^m, M4.8/2N, N04E42, AR10672

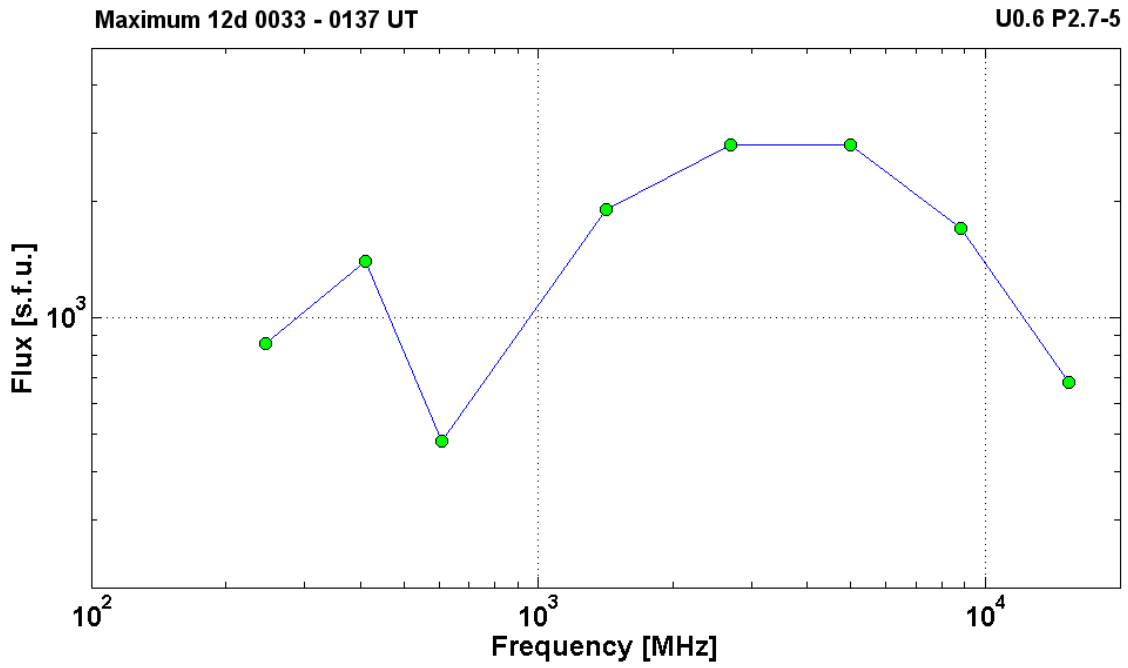
∅ solar flare 12d01^h36^m, M3.2/SN, S14W61, AR10667

Main X-ray burst 1–8 Å onset – 12d00^h04^m, max – 12d00^h56^m, Φ = 0.15 J/m²

CME: 12d00^h36^m, V = 1328 km/s, Δφ = 360°, dA = 132°

▲ SC 13d20^h03^m;

2004	September 12	☉		AR10672		To event 452	
Hα	6563 Å	0008	0035	0201	N04E42	2N	FHUZ
1 – 12	keV	0004	0056	0133		M4.8	1.5E-1
50-100	keV	000216	003934	010448		12612176	HESSI
15.4	GHz	0032.0	0119.0	0000.0		2.83	
8.8	GHz	0029.0	0121.0	0256.0		3.23	
5	GHz	0023.0	0119.0	0246.0	U0.6 P2.7-5	3.45	
2.7	GHz	0026.0	0121.0	0246.0		3.45	
1.4	GHz	0024.0	0116.0	0000.0		3.28	
610	MHz	0026.0	0033.0	0205.0		2.68	
410	MHz	0028.0	0137.0	0200.0		3.15	
245	MHz	0135.0	0137.0	0140.0		2.93	
DS II	FN	0023		0029	30-57	3	
DS II	SH	0023		0029	60-110	3	
DS II	SH	0029		0049	20-90	3	
DS II	FN	0141		0150	30-90	3	
DS II	SH	0141		0150	57-180	3	
DS IV		0013		0130	30-850	2	
DS IV		0026		0200	28-180	2	
DS III	GG	0023		0038	30-130	2	
DS III	GG	0041		0111	20-180	2	
DS III	G	0135		0140	75-440	1	
DS III	G	0149		0150	20-90	3	
DS UNCLF		0043		0047	50-85	2	
CME		0036	1328 km/s	22.5 km/s ²	360°	132°	



2004 September 12

Ø

AR10667

To event 452

H α	6563 Å	0137	0138	0145	S14W61	SN	
1 – 12	keV	0136	0139	0141		M3.2	8.2E-3
12-25	keV	013740	013858	014008		343715	HESSI
410	MHz	0028.0	0137.0	0200.0		3.15	
245	MHz	0135.0	0137.0	0140.0		2.93	
DS III	G	0135		0140	75-440	1	
DS III	G	0149		0150	20-90	3	

PART 2. Event 2004.09.19 – (2004-263)

Particle event: To($E_p > 10\text{MeV}$) – 19d18^h

$T_{\text{max}_1}(E_p > 10\text{MeV})$ – 20d01^h, $J_{\text{max}_1}(E_p > 10\text{MeV})$ – 46 /cm².s.sr

$T_{\text{max}_2}(E_p > 10\text{MeV})$ – 21d02^h, $J_{\text{max}_2}(E_p > 10\text{MeV})$ – 10 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – $E_{\text{max}_1} = 390\text{ MeV}$

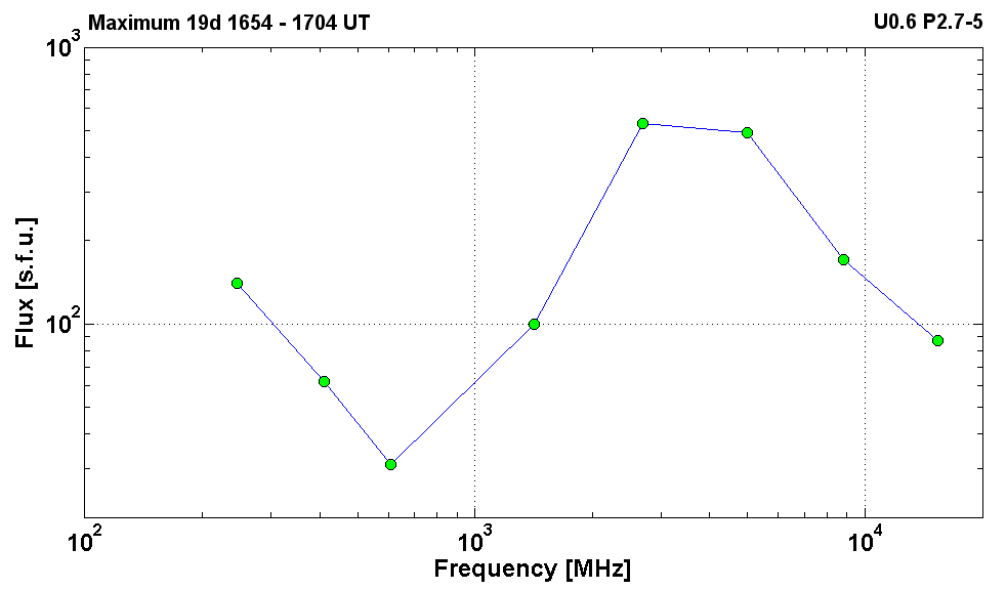
– $E_{\text{max}_2} = 100\text{ MeV}$

Sources: ☉ solar flare 19^d 16^h 46^m, M1.9/..., n03w60 AR10672

Main x-ray burst 1–8 Å: onset – 19d16^h46^m, max – 19d17^h12^m, $\Phi = 0.039\text{ Jo.m}^{-2}$

CME: gap

2004	September 19	☉			AR1010672	To event 453	
H α	6563 Å	No Flare Patrol			n03w60		
1 – 12	keV	1646	1712	1739		M1.9	3.9E-2
50-100	keV	16:43:16	17:01:22	17:02:52		71699552	HESSI
15.4	GHz	1656.0	1658.0	1713.0		1.94	
8.8	GHz	1655.0	1657.0	0000.0		2.23	
5	GHz	1651.0	1657.0	0000.0	U0.6 P2.7-5	2.69	
2.7	GHz	1649.0	1657.0	0000.0		2.72	
1.4	GHz	1650.0	1654.0	0000.0		2.00	
610	MHz	1652.0	1655.0	1655.0		1.49	
410	MHz	1655.0	1656.0	1656.0		1.79	
245	MHz	1701.0	1704.0	1706.0		2.15	
DS II		1656		1713	25-180	3	
DS IV		1716		1734	25-76	1	
DS III		1650		1653	42-180	1	
CME							gap



PART 2. Event 2004.11.01 – (2004-306)

Particle event: To(Ep>10MeV) – 01d06^h

Tmax (Ep>10MeV) – 01d08^h, Jmax (Ep>10MeV) – 54 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 420 MeV

Sources: • solar flare 01d03^h04^m, M1.1/1F, N15W41, AR10691

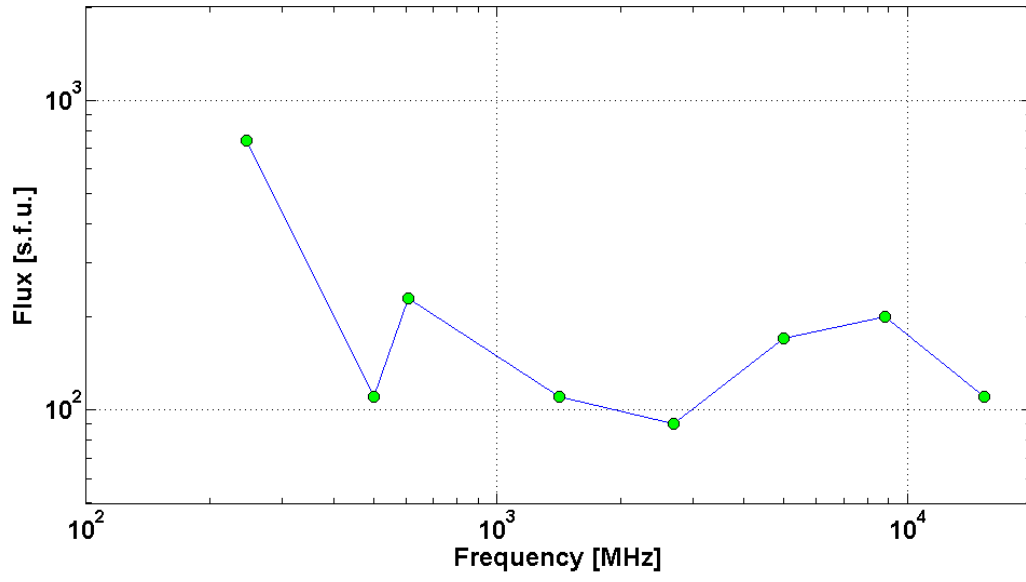
Main X-ray burst 1–8 Å: onset – 01d03^h04^m, max – 01d03^h22^m, Φ = 0.0052 J/m²

CME: 01d03^h54^m, V = 0459 km/s, Δφ = 192°, dA = 285°

2004	November 01	•			AR10691	To event 454	
Hα	6563 Å	0319	0320	0336	N15W41	1F	
1 – 12	keV	0304	0322	0326		M1.1	5.2E-3
50-100	keV	031724	032054	034328		2310280	HESSI
15.4	GHz	0319.0	0319.0	~0319.0		2.04	
8.8	GHz	0319.0	0319.0	~0319.0	U2.7 P8.8	2.30	
5	GHz	0318.0	0319.0	0319.0		2.23	
2.7	GHz	0319.0	0319.0	~0319.0		1.95	
1.4	GHz	0319.0	0319.0	~0319.0		2.04	
610	MHz	0318.0	0319.0	0320.0		2.36	
500	MHz	0318.0	0319.0	0321.0		2.04	
245	MHz	<0319.0	~0322.0	>0326.0		2.87	
DS II		0321		0331	30-220	3	
DS III	G	0308		0309	23-260	1	
DS III		0312		0320	25-180	2	
DS III	G	0317		0320	25-1200	3	
CME		0354	0459 km/s	-6.6 km/s ²	192°	285°	

Maximum 01d 0319 - 0322 UT

U2.7 P8.8



PART 2. Event 2004.11.07 – (2004-312)

Particle event: To(Ep>10MeV) – 07d01^h

Tmax₁(Ep>10MeV) – 07d23^h, Jmax₁(Ep>10MeV) – 490 /cm².s.sr

Tmax₂(Ep>10MeV) – 09d00^h, Jmax₂(Ep>10MeV) – 70 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax₁ = 335 MeV

– Emax₂ = 100 MeV

Sources: ● solar flare 07d15^h42^m, X2.0/..., n10w15, AR10696*

○ solar flare 08d15^h43^m, M2.3/1N, N08W35, AR10696

Main X-ray burst 1–8 Å: onset – 07d15^h42^m, max – 07d16^h06^m, Φ = 0.2 J/m²

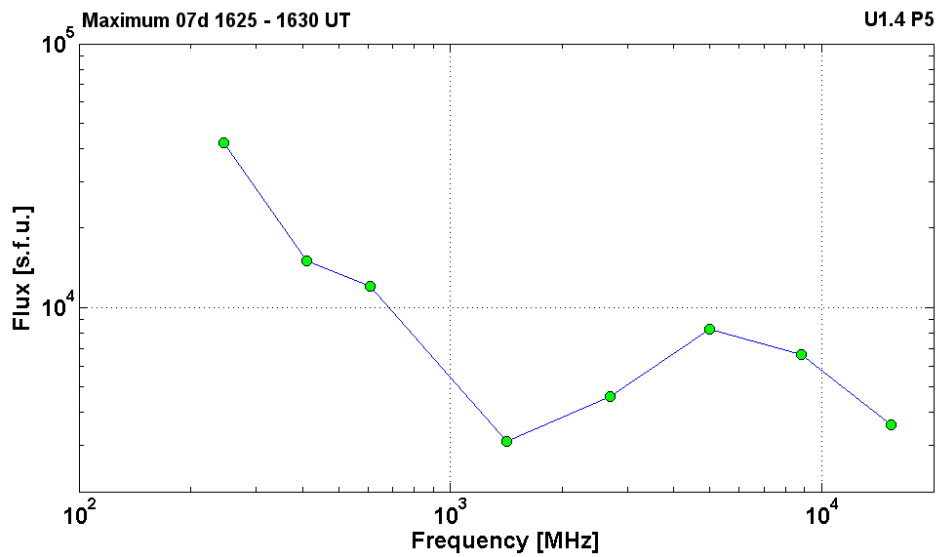
CME: 07d16^h54^m, V = 1759 km/s, Δφ = 360°, dA = 000°

▲ SC 07d02^h57^m; ▲ 07d10^h52^m; ▲ 07d18^h27^m; ▲ 09d09^h30^m;

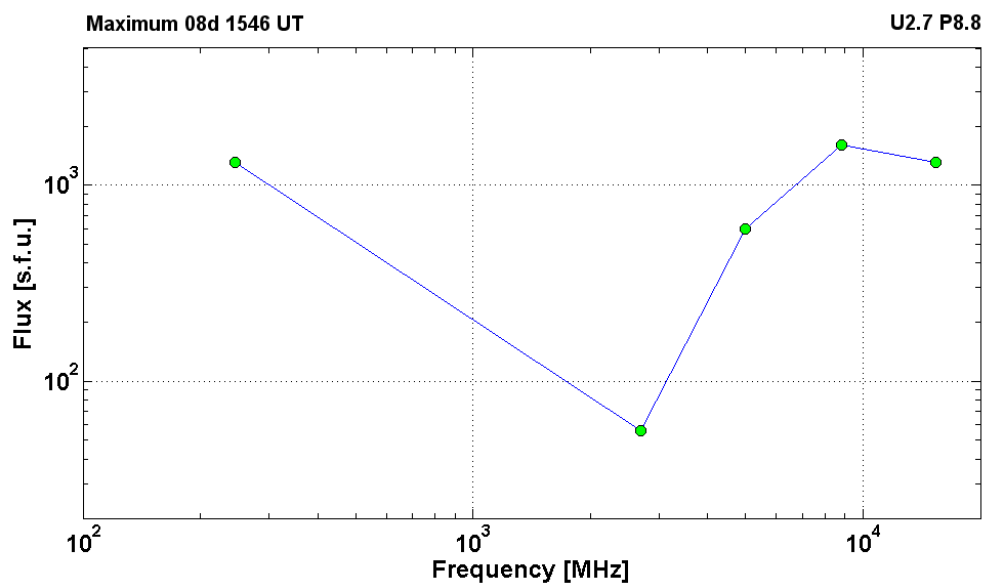
* – probable localization of the flare event

2004 November 07 ● AR10696 To event 455

Hα	6563 Å	No Flare			n10w15		
1 – 12	keV	1542	1606	1615		X2.0	2.0E-1
12-25	keV	160500	160818	162248		12506936	HESSI
100-300	keV	162248	162902	163220		3415495	HESSI
50-150	keV	1620		1627		CORONAS-F SONG	
0,18-0,7	MeV					CORONAS-F SONG	
15.4	GHz	1552.0	1627.0	0000.0		3.56	
8.8	GHz	1550.0	1627.0	1715.0		3.82	
5	GHz	1552.0	1627.0	0000.0	U1.4 P5	3.92	
2.7	GHz	1555.0	1630.0	0000.0		3.66	
1.4	GHz	1557.0	1625.0	0000.0		3.49	
610	MHz	1602.0	1626.0	1729.0		4.08	
410	MHz	1602.0	1625.0	0000.0		4.18	
245	MHz	1600.0	1625.0	1815.0		4.62	
DS II		1559		1616	25-180	1	
DS IV		1603		2106	25-180	1	
CME		1654	1759 km/s	-19.7km/s ²	360°	000°	



2004	November 08	Ø			AR10696	To event 455	
H α	6563 Å	1546	1546	1556	N08W35	1N	F
1 – 12	keV	1543	1549	1552		M2.3	6.7E-3
						Gap	HESSI
15.4	GHz	1545.0	1546.0	1546.0		3.11	
8.8	GHz	1545.0	1546.0	1546.0	U2.7 P8.8	3.20	
5	GHz	1545.0	1546.0	1547.0		2.78	
2.7	GHz	1546.0	1546.0	~1546.0		1.75	
245	MHz	1546.0	1546.0	~1546.0		3.11	
DS V		1545		1547	25-180	2	
CME							gap



PART 2. Event 2004.11.10 – (2004-315)

Particle event: To(Ep>10MeV) – 10d02^h

Tmax₁(Ep>10MeV) – 10d10^h, Jmax₁(Ep>10MeV) – 264 /cm².s.sr

Tmax₂(Ep>10MeV) – 10d16^h, Jmax₂(Ep>10MeV) – 193 /cm².s.sr

Tmax₃(Ep>10MeV) – 12d09^h, Jmax₃(Ep>10MeV) – 75 /cm².s.sr

Duration of the event – 6 days

Maximum recorded proton energy of the event – Emax₁ = 490 MeV

– Emax₂ = 430 MeV

– Emax₃ = 110 MeV

Sources: ● solar flare 09d16^h59^m, M8.9/2N, N07W51, AR10969

○ solar flare 10d01^h59^m, X2.5/3B, N09W49, AR10969

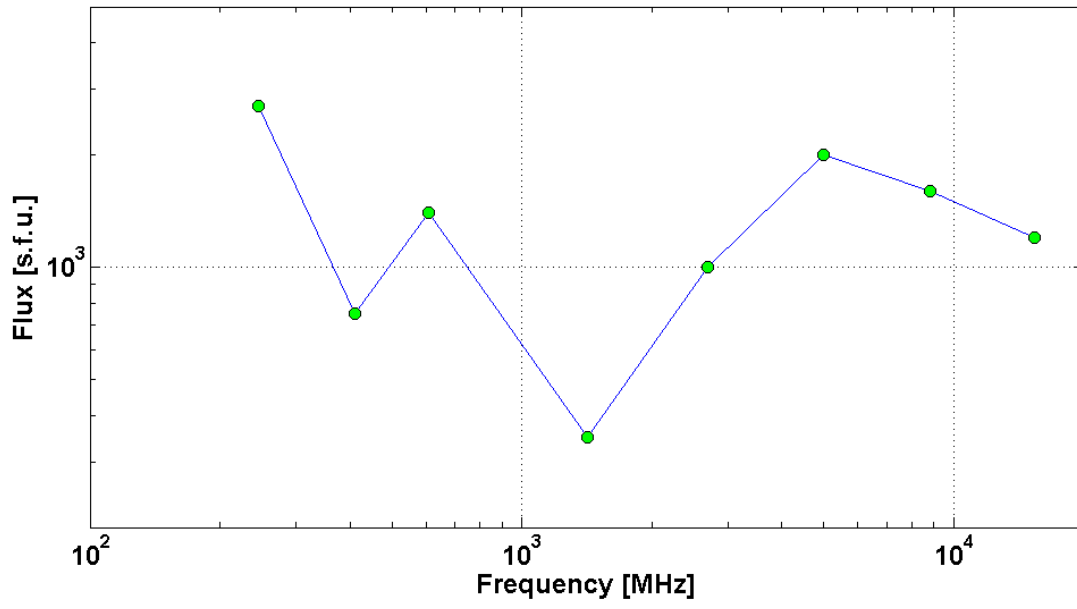
Main X-ray burst 1–8 Å: onset – 09d01^h59^m, max – 01d02^h13^m, Φ = 0.094 J/m²

CME: 09d17^h26^m, V = 2000 km/s, Δφ = 360°, dA = 299°;

▲ SC 11d17^h10^m;

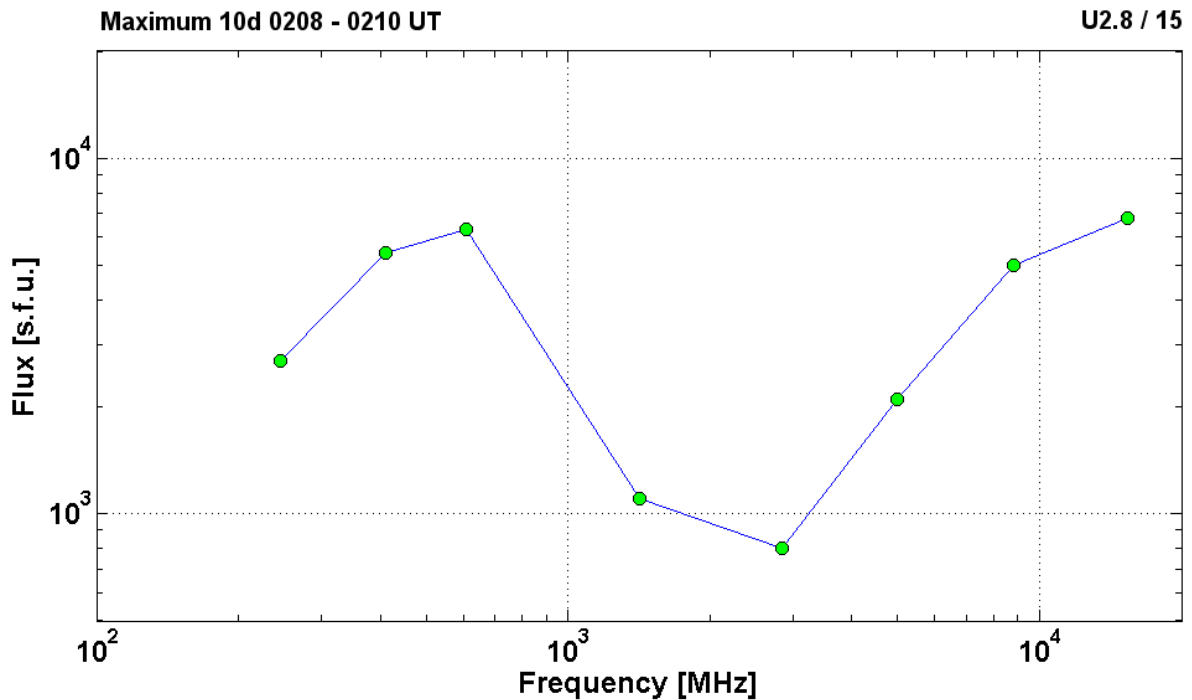
2004	November 9	●			AR10966	To event 456	
Hα	6563 Å	1705	1711	1829	N07W51	2N	UZ
1 – 12	keV	1659	1719	1732		M8.9	9.4E-2
25-50	keV	174028	174110	175528		805713	HESSI
15.4	GHz	1709.0	1711.0	1753.0		3.08	
8.8	GHz	1701.0	1710.0	0000.0		3.20	
5	GHz	1701.0	1715.0	0000.0		3.30	
2.7	GHz	1701.0	1717.0	0000.0		3.00	
1.4	GHz	1701.0	1713.0	0000.0		2.54	
610	MHz	1702.0	1716.0	0000.0		3.15	
410	MHz	1703.0	1713.0	0000.0		2.88	
245	MHz	1706.0	1714.0	1858.0		3.43	
DS II		1718		1721	25-56	1	
DS II		1724		1727	25-41	3	
DS IV		1706		2104	25-180	3	
DS III		1659		1702	25-150	1	
DS III		1711		1717	25-180	2	
410	MHz	1703.0	1747.0	0000.0		3.26	
DSF	6563 Å	1639		1731	S19W45	23°	
CME		1726	2000 km/s	-65.1 km/s ²	360°	299°	

Maximum 09d 1710 - 1717 UT



2004 November 10 • AR10696 To event 456

H α	6563 Å	0204	0210	0315	N09W49	3B	EF
1 – 12	keV	0159	0213	0220		X2.5	1.6E-1
50-100	keV	020056	021058	024024		75870032	HESSI
2.8	GHz	0200.0	0210.3	0238.0		2.90	
1.4	GHz	0205.0	0210.0	0236.0		3.04	
610	MHz	0207.0	0208.0	0000.0		3.80	
410	MHz	0207.0	0210.0	0236.0		3.73	
245	MHz	0207.0	0209.0	0236.0		3.43	
DS II		0207		0240	25-180	3	
DS IV		0206		0237	130-1200	2	
DS IV	FS	0247		0410	18-180	3	
DS III	G	0208		0210	18-1300	3	
DS III	N	0208		0230	25-180	3	
CME		0226	3387 km/s	-108.0 km/s ²	360°	302°	



PART 2. Event 2005.01.15 – (2005-015)

Particle event: To(Ep>10MeV) – 15d07^h

Tmax(Ep>10MeV) – 15d11^h, Jmax (Ep>10MeV) – 7.4 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 300 MeV

Sources: • solar flare 15d05^h54^m, M8.6/SF, N12E05, AR10720

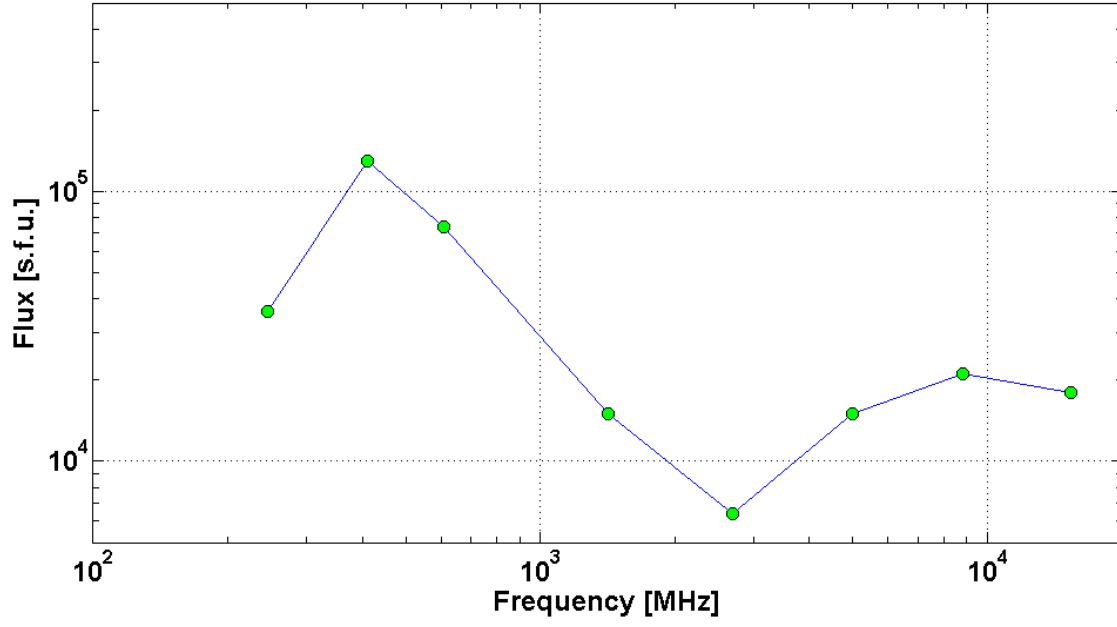
Main burst X-ray: 1–8 Å: onset – 15d05^h54^m, max – 15d06^h38^m, Φ = 0.29 J/m²

CME: 15d06^h30^m, V = 2049 km/s, Δφ = 360°, dA= 359°;

2005 January 15		•		AR10720		To event 457	
Hα	6563 Å	0556	0559	0817	N12E05	SF	UZ
1 – 12	keV	0554	0638	0717		M8.6	2.9E-1
12-25	keV	053608	053810	054124		18610	HESSI
12-25	keV	062656	062758	063804		4957986	HESSI
50-100	keV	063804	064022	065740		6039624	HESSI
25-50	keV	065740	065822	072352		3280681	HESSI
50-150	keV	0624		0632		CORONAS-F	
80-225	keV					CORONAS-F	
15.4	GHz	2211.0	2248.0	0037.0		4.26	
8.8	GHz	2230.0	2248.0	0057.0	U2.7 P8.8	4.32	
5	GHz	2207.0	2250.0	0124.0		4.18	
2.7	GHz	2224.0	2306.0	0102.0		3.81	
1.4	GHz	2227.0	2307.0	0043.0		4.18	
610	MHz	2230.0	2331.0	0045.0		4.87	
410	MHz	2230.0	2329.0	0109.0		5.11	
245	MHz	2236.0	2329.0	0047.0		4.56	
DS II		2224		2258	25-410	3	
DS IV		2233		>2400	18-1600	3	
DS III	GG	2235		2251	18-260	3	
DS III	N	2300		>2400	20-200	3	
DS III	S,C	<0000		0401	18-200	3	
DS UNCLF		2253		2300	20-45	3	
CME		0630	2049 km/s	-30.7 km/s ²	360°	359°	

Maximum 15d 2248 - 2331 UT

U2.7 P8.8



PART 2. Event 2005.01.16 – (2005-016)

Particle event: To(Ep>10MeV) – 16d00^h

Tmax(Ep>10MeV) – 16d18^h, Jmax (Ep>10MeV) – 330 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 330 MeV

Sources: • solar flare 15d21^h54^m, 3B/X2.6, N14W08, AR10720*

3B/M1.0, N14W08, AR10720*

Main X-ray burst 1–8 Å: onset – 15d22^h25^m, max – 15d23^h02^m, Φ = 0.63 J/m²

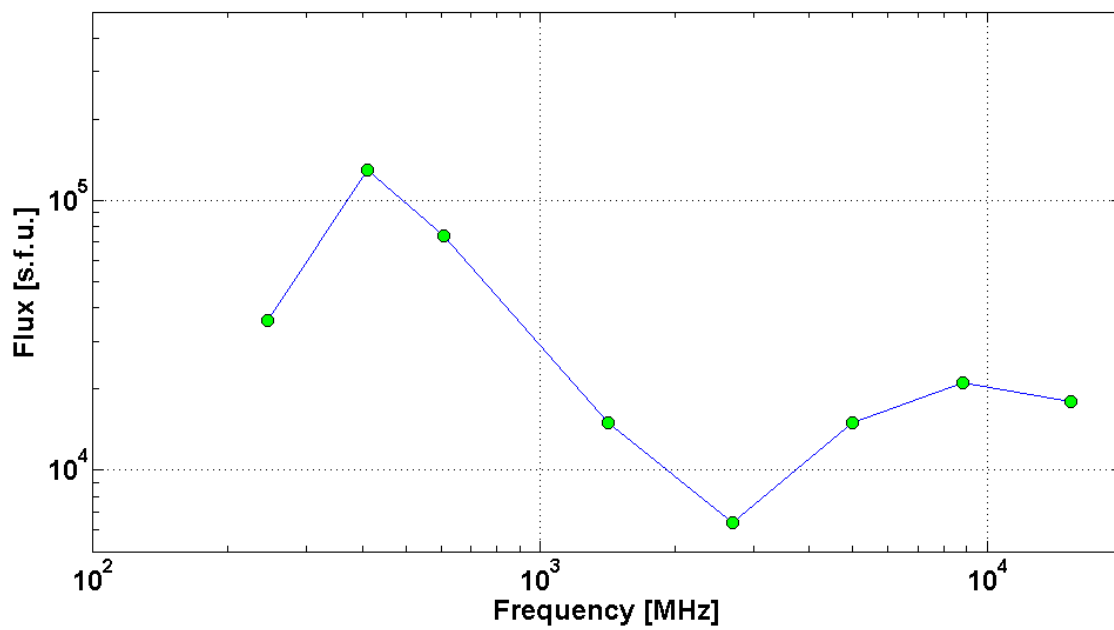
CME: 15d23^h06^m, V = 2861 km/s, Δφ = 360°, dA = 323°;

*– One flare event with two X-ray bursts

2005	January 15	•	AR10720	To event 458			
Hα	6563 Å	2154	2249	>0009	N14W08	3B	UZ
1 – 12	keV	2201	2208	2216		M1.0	6.9E-03
1 – 12	keV	2225	2302	2331		X2.6	6.3E-01
12-25	keV	221504	221506	222032		78718	HESSI
300-800	keV	222032	224958	230256		44250936	HESSI
100-300	keV	230256	230626	231740		22362556	HESSI
12-25	keV	234832	234930	000308		5883697	HESSI
50-150	keV	2238		2255		CORONAS-F,	
225-750	keV					CORONAS-F,	
15.4	GHz	2211.0	2248.0	0037.0		4.26	
8.8	GHz	2230.0	2248.0	0057.0	U2.7 P8.8	4.32	
5	GHz	2207.0	2250.0	0124.0		4.18	
2.7	GHz	2224.0	2306.0	0102.0		3.81	
1.4	GHz	2227.0	2307.0	0043.0		4.18	
610	MHz	2230.0	2331.0	0045.0		4.87	
410	MHz	2230.0	2329.0	0109.0		5.11	
245	MHz	2236.0	2329.0	0047.0		4.56	
DS II		2224		2258	25-410	3	
DS IV		2233		>2400	18-1600	3	
DS III	GG	2235		2251	18-260	3	
DS III	N	2300		>2400	20-200	3	
DS III	S,C	<0000		0401	18-200	3	
DS UNCLF		2253		2300	20-45	3	
CME		2306	2861 km/s	-127.4km/s ²	360°	323°	

Maximum 15d 2248 - 2331 UT

U2.7 P8.8



PART 2. Event 2005.01.17 – (2005-017) – GLE-68

Particle event: To(Ep>10MeV) – 17d13^h

Tmax(Ep>10MeV) – 17d17^h, Jmax (Ep>10MeV) – $3.8 \cdot 10^3$ /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 490 MeV

Sources: • solar flare 17d06^h59^m, X3.8/3N, N14W249, AR10720

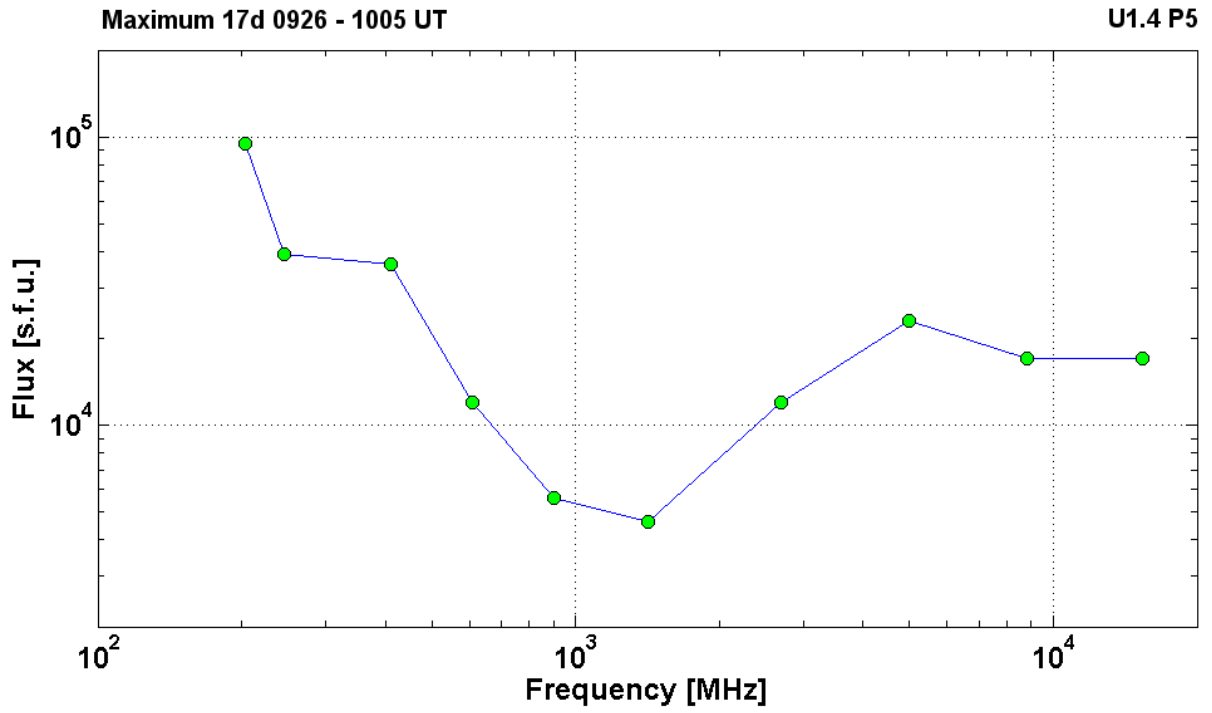
Main X-ray burst 1–8 Å onset – 17d06^h59^m, max – 17d09^h52^m, Φ = 0.84 J/m²

CME: 17d09^h30^m, V = 2094 km/s, Δφ = 360°, dA = 334°

CME: 17d09^h54^m, V = 2547 km/s, Δφ = 360°, dA = 309°

2005	January 17	•			AR10720	To event 459	
Hα	6563 Å	<0906	0951	1157	N14W24	3N	FU
1 – 12	keV	0659	0952	1007		X3.8	8.4E-1
25-50	keV	065956	070258	070920		264551	HESSI
12-25	keV	070920	071334	072628		718159	HESSI
50-100	keV	080232	080510	081028		22362556	HESSI
12-25	keV	234832	234930	000308		7958930	HESSI
100-300	keV	093536	094942	103852		53152512	HESSI
50-150	keV	0952		1000		CORONAS-F,	
150-500	keV					CORONAS-F,	
500-1300	keV					CORONAS-F,	
2-6	MeV					CORONAS-F,	
15.4	GHz	0744.0	0943.0	1207.0		4.23	
8.8	GHz	0755.0	0926.0	1102.0		4.23	
5	GHz	0756.0	0929.0	1207.0	U1.4 P5	4.36	
2.7	GHz	0804.0	0931.0	1207.0		4.08	
1.4	GHz	0853.0	0931.0	1102.0		3.66	
900	MHz	0839.0	0926.7	>1054.0		3.75	
610	MHz	<0845.0	0926.0	>1209.0		4.08	
410	MHz	0812.0	0957.0	1207.0		4.56	
245	MHz	0755.0	1005.0	1207.0		4.59	
204	MHz	0943.1	0943.9	0945.7		4.98	
DS II		0916		0924	26-95	2	
DS II		0944		0947	25-65	3	
DS IV	P,S,C	0837		1120	100-4000	3	
DS IV		0900		1524	25-180	2	
DS I	S,C	<0650		>1200	45-270	2	
DS III	GG,P	0923		0934	25-270	2	
DS III		0941		0946	25-180	3	
DS CONT		0657		0900	25-180	1	
DS CONT	P	~0840		>1200	25-270	2	
DS DCIM	GG	0841		1132	800-2000	3	

CME		0930	2094 km/s	-118.8 km/s ²	360°	334°	
CME		0954	2547 km/s	-159.1 km/s ²	360°	309°	



PART 2. Event 2005.01.20 – (2005-020) – GLE-69

Particle event: To(Ep>10MeV) – 20d07^h

Tmax₁(Ep>10MeV) – 20d10^h, Jmax₁ (Ep>10MeV) – 1.1·10³ /cm².s.sr

Tmax₂(Ep>10MeV) – 21d17^h, Jmax₂ (Ep>10MeV) – 134 /cm².s.sr

Duration of the event – 4 days

Maximum recorded proton energy of the event – Emax₁ = 2650 MeV

– Emax₂ = 500 MeV

Sources: ● solar flare 20d06^h36^m, X7.1/2B, N12W58, AR10720

Main X-ray burst 1–8 Å: onset – 20d06^h36^m, max – 20d07^h01^m, Φ = 1.3 J/m²

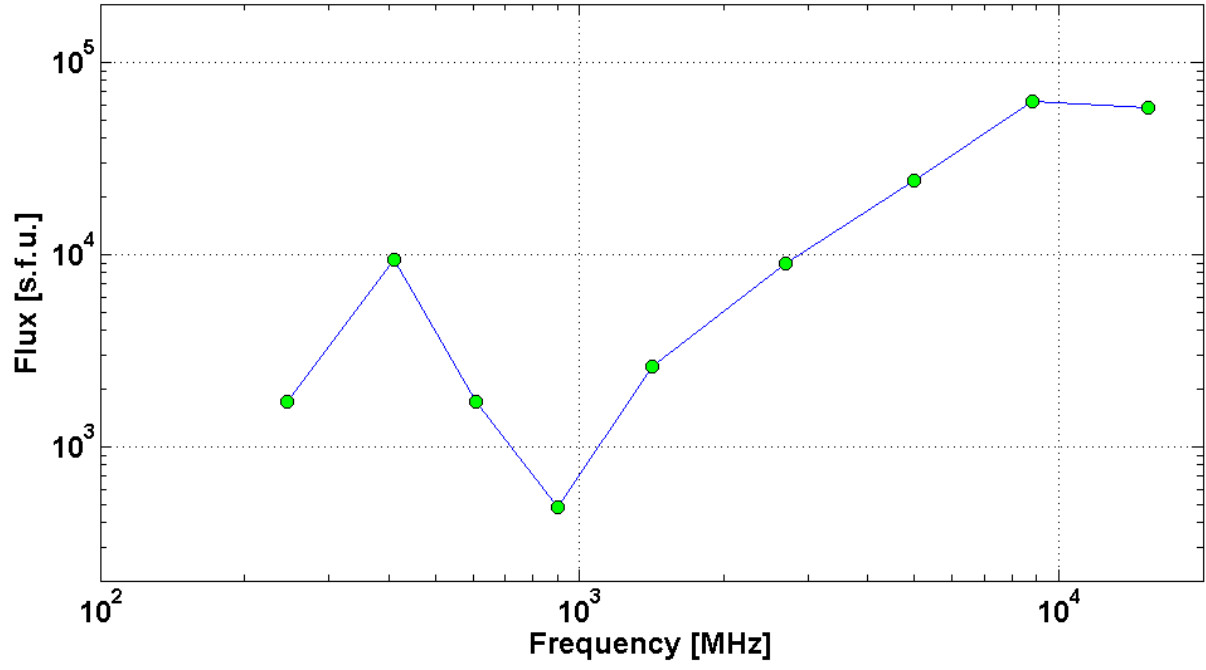
CME: 06^h54^m, V = 882 km/s, Δφ = 360°, dA = 288°

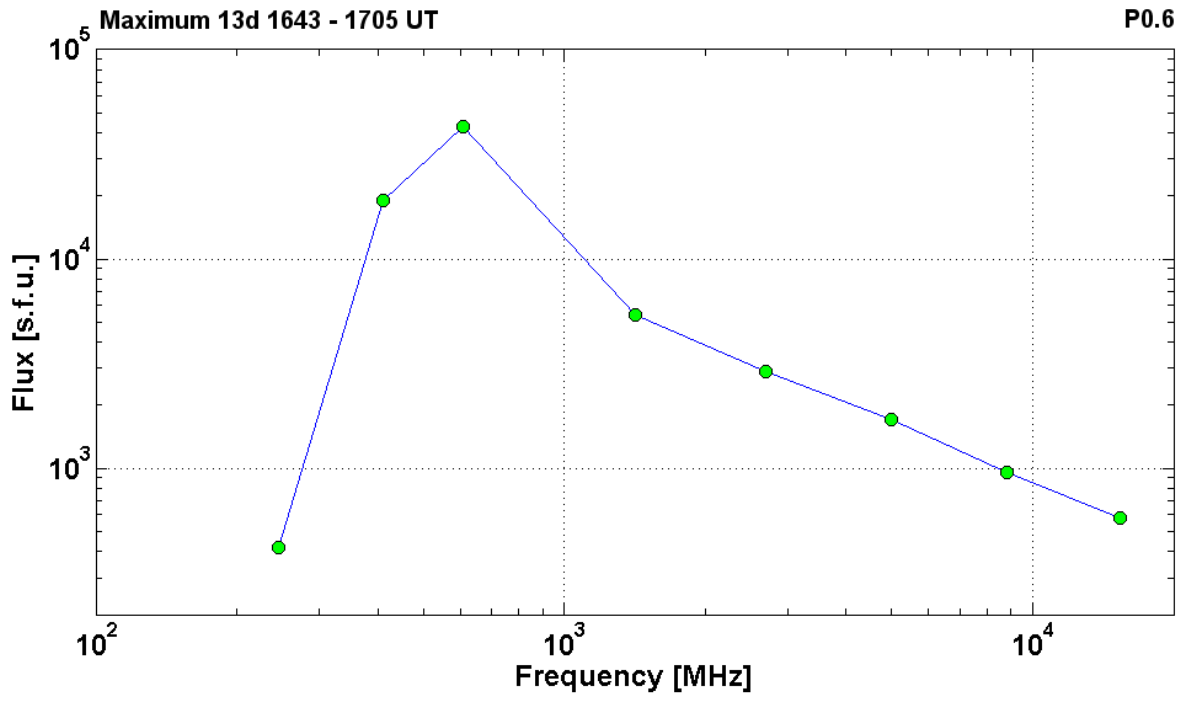
▲ SC 21d17^h11^m;

2005	January 20	●	AR10720			To event 460	
Hα	6563 Å	0641	0646	0854	N12W58	2B	UZ
1 – 12	keV	0636	0701	0726		X7.1	1.3E00
300-800	keV	062036	065110	072716		318884832	HESSI
25-50	keV	075452	075534	084840		11856082	HESSI
50-150	keV	0944		0956		CORONAS-F	
150-500	keV					CORONAS-F	
500-1300	keV					CORONAS-F	
90-150	MeV					CORONAS-F	
15.4	GHz	0642.0	0649.0	0822.0		4.76	
8.8	GHz	0635.0	0647.0	0806.0	U0.9 P8.8	4.79	
5	GHz	0638.0	0649.0	0844.0		4.38	
2.7	GHz	0639.0	0657.0	0840.0		3.95	
1.4	GHz	0639.0	0644.0	0752.0		3.41	
900	MHz	~0703.9	~0703.9	>0727.0		2.68	
610	MHz	0640.0	0643.0	0000.0		3.23	
410	MHz	0639.0	0643.0	0000.0		3.97	
245	MHz	0639.0	0707.0	0832.0		3.23	
DS II	SH	0644		~0700	18-160	3	
DS IV	FS	0636		>0800	20-900	2	
DS IV		0643		0728	30-210	3	
DS IV		0643		1055	25-180	2	
DS I	N,C	0755		~0950	45-270	2	
DS III	GG	0645		0701	18-180	3	
DS III	G	0729		0738	18-170	3	
DS CONT	DC	0655		0657	140-200	2	
DS CONT	DC	0702		0710	90-150	2	
DS DCIM	S,C	0830		0856	200-4000	2	
DS UNCLF	RS	0755		0755	40-270	2	
CME		0654	0882 km/s	16.0km/s ²	360°	288°	

Maximum 20d 0643 - 0707 UT

U0.9 P8.8





PART 2. Event 2005.06.16– (2005-167)

Particle event: To(Ep>10MeV) – 16d20^h

Tmax(Ep>10MeV) – 17d04^h, Jmax (Ep>10MeV) – 41 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax = 510 MeV

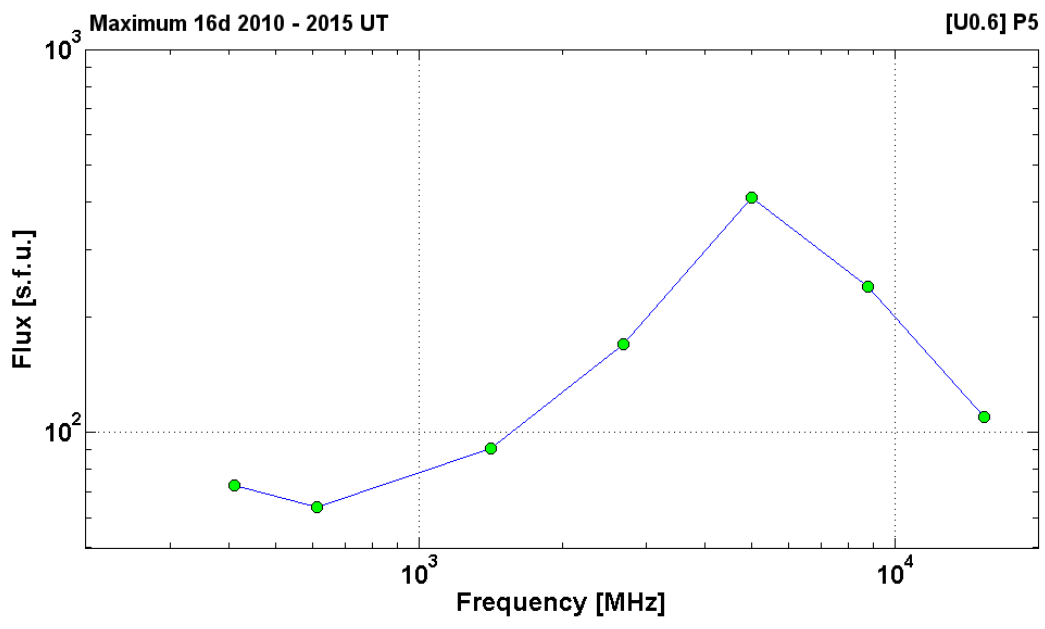
Sources: • solar flare 16d20^h01^m, M4/SF, N09W87, AR10775

Main X-ray burst 1–8 Å: onset – 16d20^h01^m, max – 16d20^h22^m, Φ = 0.062 J/m²

CME: gap

2005 June 16 • AR10775 To event 462

Hα	6563 Å	2009	~2010	2016	N09W87	SF	EF
1 – 12	keV	2001	2022	2042		M4.0	6.2E-2
50-150	keV	2007		2012		CORONAS-F SONG	
80-225	keV					CORONAS-F SONG	
15.4	GHz	2010.0	2011.0	0000.0		2.04	
8.8	GHz	2008.0	2010.0	0000.0		2.38	
5	GHz	2007.0	2010.0	0000.0		2.61	
2.7	GHz	2008.0	2011.0	0000.0		2.23	
1.4	GHz	2007.0	2010.0	0000.0		1.96	
610	MHz	2008.0	2012.0	2012.0		1.81	
410	MHz	2010.0	2015.0	2015.0	[U0.6] P5	1.86	
DS II		2010		2016	30-180	3	
DS IV		2017		2026	25-110	2	
DS III	B	2002		2002	25-100	1	
DS III	B	2027		2028	25-40	2	
CME							gap



PART 2. Event 2005.07.10 – (2005-191)

Particle event: To(Ep>10MeV) – 10d03^h

Tmax₁(Ep>10MeV) – 10d05^h, Jmax₁(Ep>10MeV) – 1.1 /cm².s.sr

Tmax₂(Ep>10MeV) – 10d12^h, Jmax₂(Ep>10MeV) – 1.9 /cm².s.sr

Duration of the event – 2.5 days

Maximum recorded proton energy of the event – Emax₁ = 75 MeV

– Emax₂ = 70 MeV

Sources: ● solar flare 09d21^h47^m, M2.8/1N, N11W27, AR10786

Main X-ray burst 1–8 Å: onset – 09d21^h 47^m, max – 09d22^h06^m, Φ = 0.029 J/m²

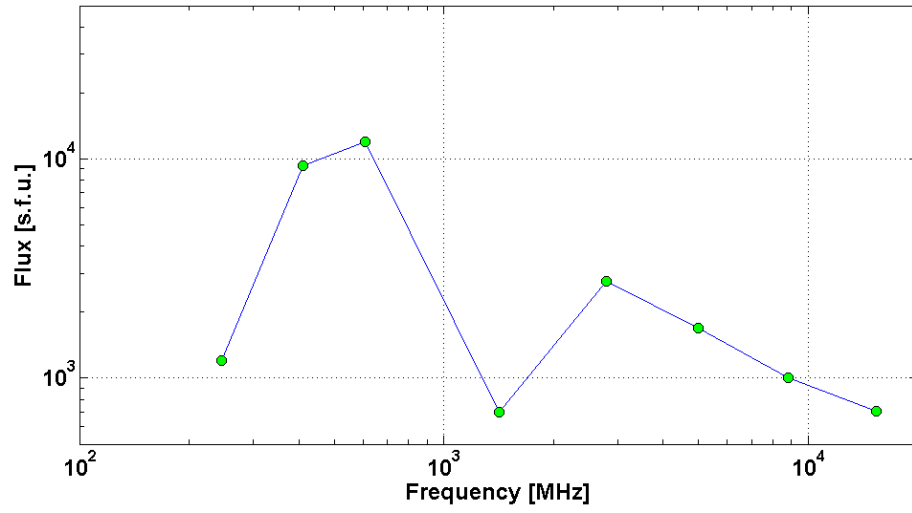
CME: 09d22^h30^m, V = 1540 km/s, Δφ = 360°, dA = 328°;

▲ SC 10d03^h37^m;

2005	July 09	●			AR10786	To event 463	
Hα	6563 Å	2156	2204	2238	N11W27	1N	FU
1 – 12	keV	2147	2206	2219		M2.8	2.9E-2
15.4	GHz	2158.0	2207.0	0000.0		2.85	
8.8	GHz	2155.0	2206.0	0000.0		3.00	
5	GHz	2152.0	2206.0	0000.0		3.23	
2.8	GHz	2147.0	2209.0	2209.0	P0.6 U1.4 P2.8	3.44	
1.4	GHz	2156.0	2208.0	2217.0		2.85	
610	MHz	2149.0	2214.0	2220.0		4.08	
410	MHz	2150.0	2208.0	2217.0		3.97	
245	MHz	2153.0	2208.0	2218.0		3.08	
DS II	SH	2159		2205	23-90	3	
DS II	SH	2203		2217	20-180	2	
DS IV		2152		2223	25-2000	2	
DS IV	FS	2155		>2400	20-180	2	
DS III	GG	2203		2209	20-80	3	
DS UNCLF		2211		2215	130-180	2	
CME		2230	1540 km/s	-168.5 km/s	360°	328°	

Maximum 09d 2206 - 2214 UT

P0.6 U1.4 P2.8



PART 2. Event 2005.07.13 – (2005-194)

Particle event: To(Ep>10MeV) – 13d17^h

Tmax(Ep>10MeV) – 15d04^h, Jmax (Ep>10MeV) – 9.7 /cm².s.sr

Duration of the event – 1 day

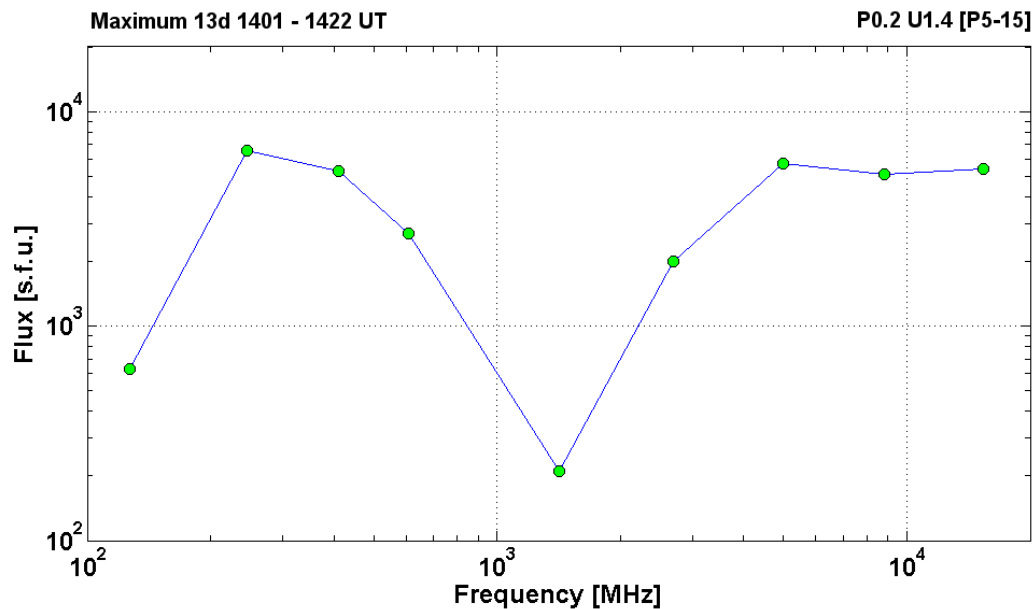
Maximum recorded proton energy of the event – Emax = 115 MeV

Sources: ● solar flare 13d14^h01^m, M5/SF, N10W80, AR10786

Main X-ray burst 1–8 Å: onset – 13d14^h01^m, max – 13d14^h49^m, Φ = 0.2 J/m²

CME: 13d14^h30^m, V = 1423 km/s, Δφ = 360°, dA = 303°;

2005	July 13	●	AR10786		To event 464		
Hα	6563 Å	1422	1437	1458	N10W80	SF	F
1 – 12	keV	1401	1449	1538		M5.0	2.0E-1
100-300	keV	141300	143522	144404		20887532	HESSI
12-25	keV	144404	151422	151740		490896	HESSI
15.4	GHz	1401.0	1417.0	1505.0	P0.2 U1.4 [P5-15]	3.73	
8.8	GHz	1401.0	1417.0	0000.0		3.71	
5	GHz	1358.0	1418.0	1447.0		3.76	
2.7	GHz	1401.0	1419.0	1443.0		3.30	
1.4	GHz	1358.0	1420.0	1440.0		2.32	
610	MHz	1345.0	1401.0	1412.0		3.43	
410	MHz	1351.0	1403.0	1421.0		3.72	
245	MHz	1357.0	~1403.0	1422.0		3.82	
127	MHz	1411.6	1422.3	1424.6		2.80	
DS III		1406		1411	30-180	2	
DS V		1401		1409	25-180	2	
CME		1430	1423 km/s	-14.1 km/s	360°	303°	



PART 2. Event 2005.07.14 – (2005-195)

Particle event: To(Ep>10MeV) – 14d14^h

Tmax(Ep>10MeV) – 15d03^h, Jmax (Ep>10MeV) – 130 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax = 190 MeV

Sources: ■ solar flare 14d10^h16^m, X1.2/..., n13w80, AR10786* – near W-limb

∅ solar flare 14d05^h57^m, M9.1/1N, N11W73, AR10786

∅ solar flare 14d22^h50^m, M1.1/..., n13w89, AR10786*

Main X-ray burst 1-8 Å: onset – 14d10^h16^m, max – 14d10^h55^m, Φ = 0,39 J/m²

CME: 14d10^h54^m, V = 2115 km/s, Δφ =360°, dA = 296°;

▲ SC 17d01^h34^m;

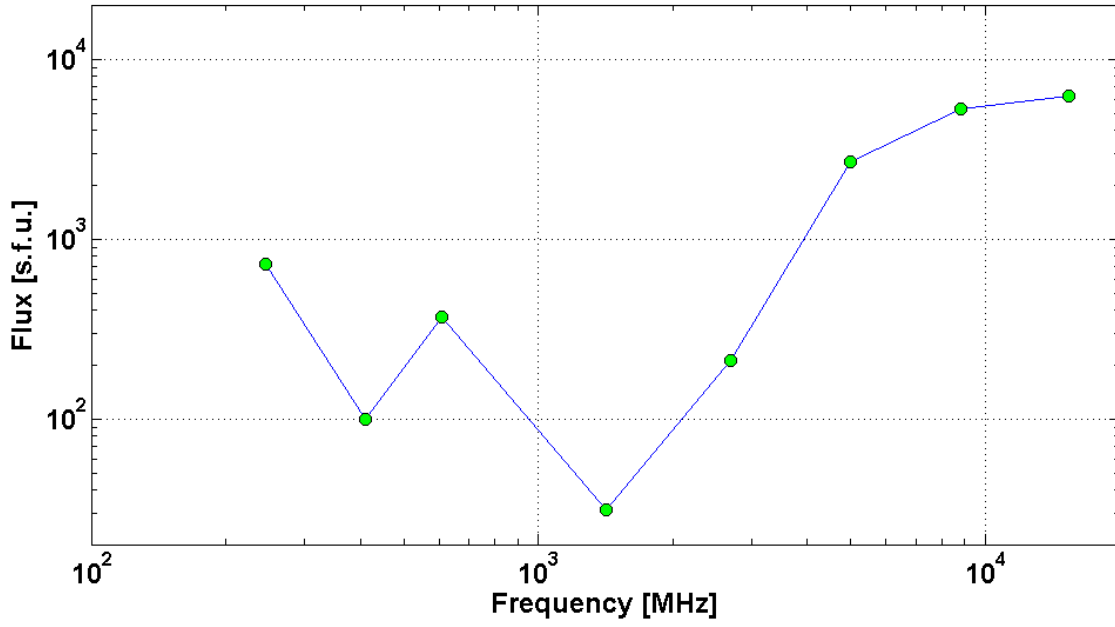
* – probable localization of the flare event

2005 July 14 ■ AR10786 To event 465

Hα	6563 Å	No Flare Patrol			n13w80		
1 – 12	keV	1016	1055	1129		X1.2	3.9E-1
25-50	keV	101508	102742	112956		4398593	HESSI
25-50	keV	105952	110402	112548		14154225	HESSI
15.4	GHz	1019.0	1034.0	1144.0	[U1.4]/15	3.79	
8.8	GHz	1020.0	1034.0	1145.0		3.72	
5	GHz	1020.0	1035.0	1143.0		3.43	
2.7	GHz	1021.0	1033.0	0000.0		2.32	
1.4	GHz	1029.0	1033.0	0000.0		1.49	
610	MHz	1033.0	1033.0	0000.0		2.57	
410	MHz	1025.0	1032.0	0000.0		2.00	
245	MHz	1026.0	1032.0	0000.0		2.86	
DS IV	P,C	1023		1212	200-4000	3	
DS IV		1025		1146	25-180	2	
DS III		1019		1019	25-47	1	
DS DCIM	GG	1018		1128	2000-4500	3	
DS DCIM	GG,SP	1021		1149	800-2000	3	
9.1	GHz	1018.7	1056.3			3.48	
2.7	GHz	1021.0	1059.0	1136.0		3.53	
1.4	GHz	1029.0	1107.0	0000.0		4.11	
610	MHz	1047.0	1110.0	0000.0	P0.6	5.08	
410	MHz	1025.0	1111.0	1222.0		4.72	
245	MHz	1026.0	1111.0	1211.0		3.73	
CME		1054	2115 km/s	198.0km/s ²	360°	296°	

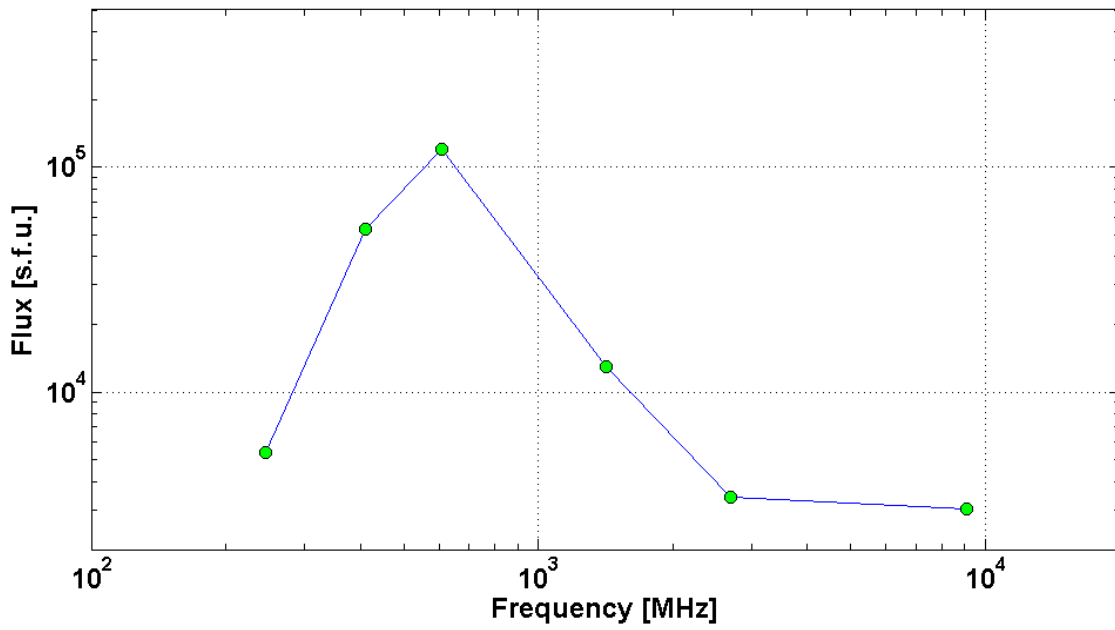
Maximum 14d 1032 - 1035 UT

[U1.4] / 15

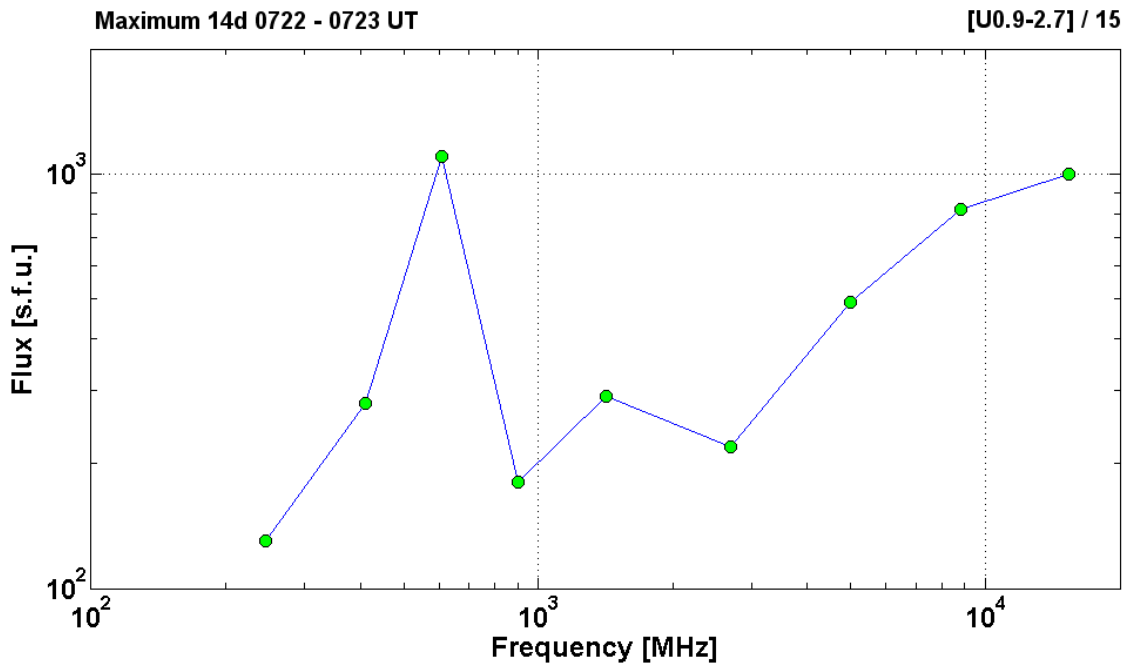


Maximum 14d 1056 - 1111 UT

P0.6



2005 July 14		ø			AR10758	To event 465	
H α	6563 Å	0723	0724	0732	N11W73	1N	FM
1 – 12	keV	0557	0725	0743		M9.1	8.4E-2
12-25	keV	061224	061926	070720		1402202	HESSI
6-12	keV	070720	070926	071348		63166	HESSI
6-12	keV	071348	071550	071644		25014	HESSI
50-150	keV	0723		0724		CORONAS-F	
2-6	MeV					CORONAS-F	
15.4	GHz	0722.0	0723.0	0723.0	[U0.9-2.7]/15	3.00	
8.8	GHz	0722.0	0723.0	0723.0		2.91	
5	GHz	0722.0	0723.0	0723.0		2.69	
2.7	GHz	0722.0	0723.0	0723.0		2.34	
1.4	GHz	0722.0	0723.0	0723.0		2.46	
900	MHz	0722.3	0722.8	0730.9		2.26	
610	MHz	0723.0	0723.0	~0723.0		3.04	
410	MHz	0722.0	0722.0	0724.0		2.45	
245	MHz	0722.0	0723.0	0724.0		2.11	
DS III	G	0722		0727	25-700	3	
DS III	G	0729		0738	25-600	1	
DS V		0722		0726	25-180	2	
DS DCIM	P,C	0722		0737	200-4000	3	
DS DCIM	G	0735		0737	800-2000	2	
CME		0754	0752 km/s	-2.6 km/s ²	103°	237°	



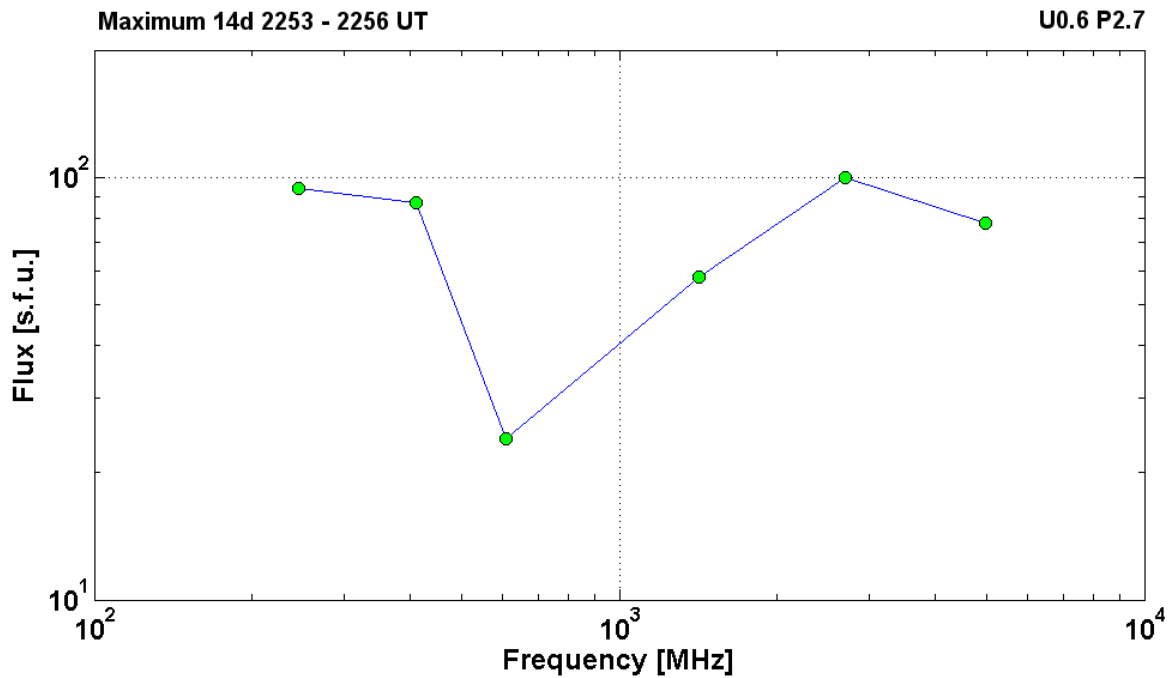
2005 July 14

Ø

AR10758

To event 465

H α	6563 Å	No Flare Patrol			n13w89		
1 – 12	keV	2250	2257	2309		M1.1	4.8E-3
12-25	keV	225104	225822	230920		652561	HESSI
5	GHz	2254.0	2254.0	2255.0		1.89	
2.7	GHz	2254.0	2255.0	2255.0	U0.6 P2.7	2.00	
1.4	GHz	2254.0	2255.0	2255.0		1.76	
610	MHz	<2253.0	2253.0	>2253.0		1.38	
410	MHz	<2253.0	2253.0	>2253.0		1.94	
245	MHz	2256.0	2256.0	2257.0		1.97	
DS III	GG	2253		2307	18-180	3	
CME		2330	0724 km/s	0.2 km ² /s	033°	270°	



PART 2. Event 2005.07.17 – (2005-198)

Particle event: To(Ep>10MeV) – 17d14^h

Tmax₁(Ep>10MeV) – 17d18^h, Jmax₁(Ep>10MeV) – 12 /cm².s.sr

Tmax₂(Ep>10MeV) – 17d22^h, Jmax₂(Ep>10MeV) – 19 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 85 MeV

– Emax₂ = 85 MeV

Sources:☐ solar flare 17d10^h25^m, B1.1/..., n13w90, AR10786* – 3d behind W-limb;

Main X-ray burst 1–8 Å: onset – 17d10^h25^m, max – 17d10^h32^m; Φ = 0,00013 J/m²

CME: 17d11^h30^m, V = 1527 km/s, Δφ = 360°, dA=316°;

2005 July 17 ☐ AR10786 To event 466

Hα	6563 Å	No Flare			n13w90		
1 – 12	keV	1025	1032	1045		B1.1	1.3E-4
6-12	keV	102652	102758	103008		23160	HESSI
CME		1130	1527 km/s	59.2 km/s ²	360°	316°	

PART 2. Event 2005.07.25 – (2005-206)

Particle event: To(Ep>10MeV) – 25d21^h

Tmax₁(Ep>10MeV) – 28d14^h, Jmax₁(Ep>10MeV) – 30 /cm².s.sr

Tmax₂(Ep>10MeV) – 29d14^h, Jmax₂(Ep>10MeV) – 36 /cm².s.sr

Duration of the event – 6 days

Maximum recorded proton energy of the event – Emax₁ = 90 MeV

– Emax₂ = 90 MeV

Sun source: □ high flare activity AR10792 – 2d behind E-limb;

∅ solar flare 27d 04^h 33^m, M3.7/..., n10e90 AR10792*

∅ solar flare 27d 22^h 39^m, C4.5/..., n06e90 AR10792*

∅ solar flare 28d 21^h 39^m, M4.8/SF, N08E84 AR10792

Main X-ray burst 1–8 Å: onset – 26d04^h49^m, max – 05^h03^m, Φ = 0.0002 J/m²

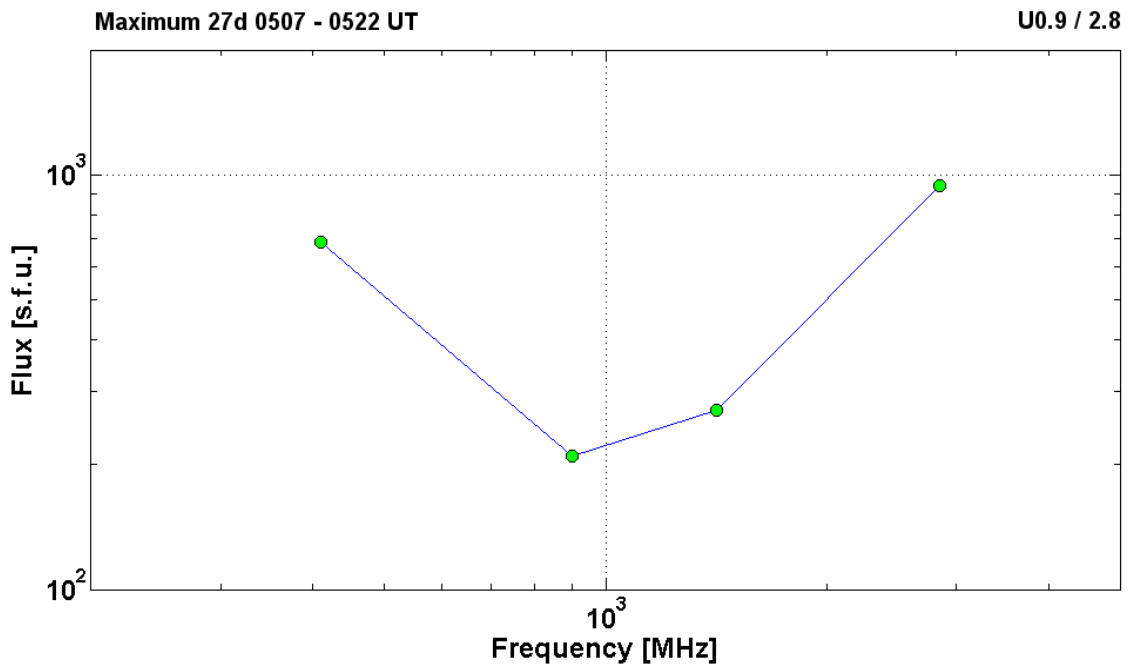
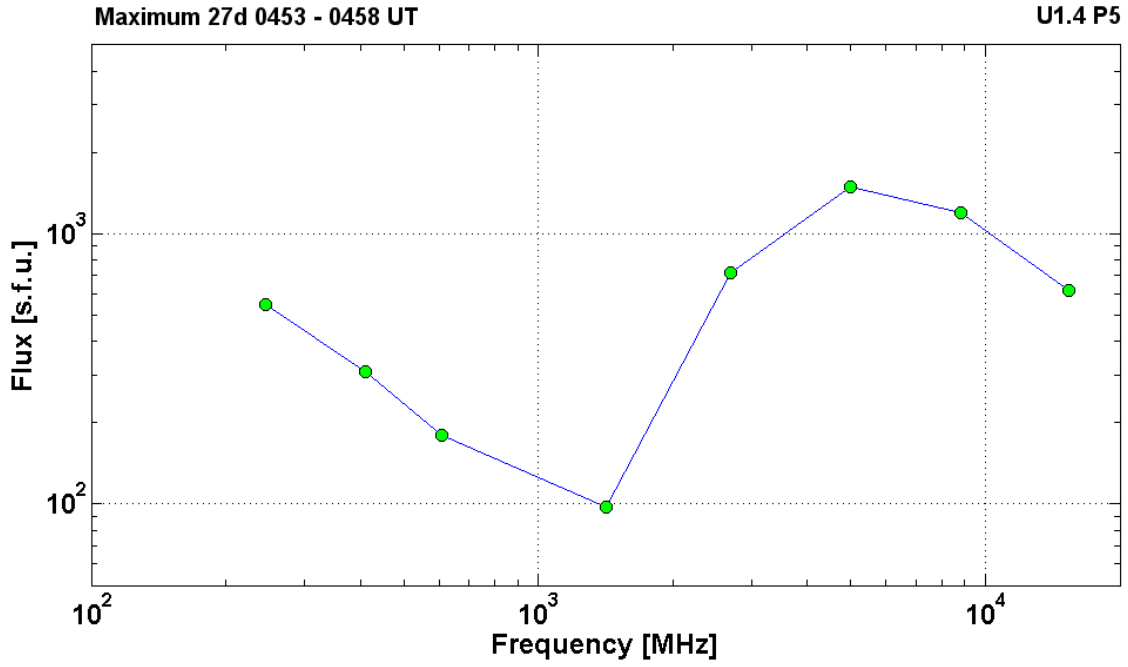
CME: 26d04^h54^m, V=1458 km/s, Δφ = 360°, dA = 90°.

▲ SC 27d19^h39^m;

* – probable localization of the flare event

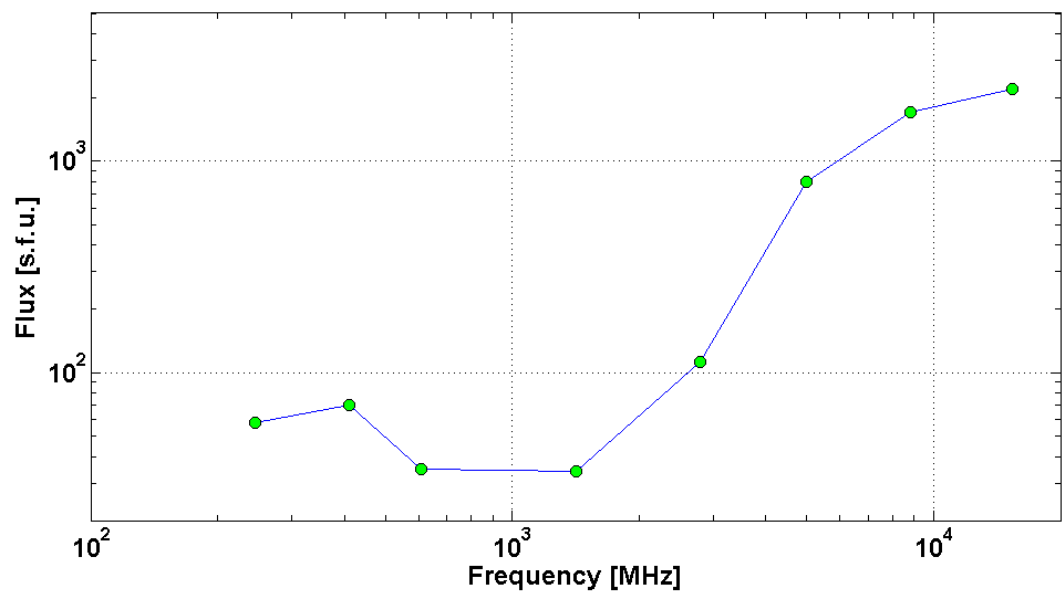
2005 July 27		∅ AR10792			To event 467		
Ha	6563 Å	No Flare			n10e90		
1 – 12	keV	0433	0502	0530		M3.7	7.9E-2
50-100	keV	04:49:56	04:57:34	05:42:12		200402302	HESSI
12-25	keV	14:44:04	15:14:22	15:17:40		490896	HESSI
15.4	GHz	0450.0	0457.0	0530.0		2.79	
8.8	GHz	0447.0	0456.0	0535.0		3.08	
5	GHz	0447.0	0457.0	0457.0	U1.4 P5	3.18	
2.7	GHz	0445.0	0457.0	0457.0		2.86	
1.4	GHz	0445.0	0457.0	0457.0		1.99	
610	MHz	0444.0	0454.0	0512.0		2.26	
410	MHz	0450.0	0453.0	0506.0		2.49	
245	MHz	0445.0	0458.0	0503.0		2.74	
DS II	SH	0443		0503	20-130	3	
DS IV		0446		0524	25-180	1	
DS IV	P	0452		0523	200-4000	3	
DS III	S,C	0445		0535	20-180	1	
DS UNCLF		0454		0458	40-60	2	
2.8	GHz	0430.0	0507.3	0610.0	U0.9 / 2.8	2.97	
1.4	GHz	0444.0	0507.0	0531.0		2.43	
900	MHz	0439.3	0508.5			2.32	
410	MHz	0444.0	0522.0	0535.0		2.84	
DS DCIM	G	0510		0542	800-2000	2	
EPL	6563 Å	0439		0511	N11E90		

CME		0454	1787km/s	-75.4 km/s	360°	084°	
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2005 July 27		ø			AR10792	To event 467	
H α	6563 Å	No Flare Patrol			n06e90		
1 – 12	keV	2239	2300	2315		C4.5	6.3E-3
CME		0030	854 km/s	-0.5 km/s ²	079°	090°	

2005 July 28		ø			AR10792	To event 467	
H α	6563 Å	2151	2200	2221	N08E84	SF	FH
1 – 12	keV	2139	2208	2224		M4.8	8.1E-2
12-25	keV	221244	221342	231452		2447943	HESSI
15.4	GHz	2142.0	2154.0	2210.0	U0.6-1.4 / 15	3.34	
8.8	GHz	2142.0	2153.0	2220.0		3.23	
5	GHz	2142.0	2154.0	2220.0		2.90	
2.8	GHz	2147.0	2154.0	2209.0		2.05	
1.4	GHz	2152.0	2204.0	2204.0		1.53	
610	MHz	2201.0	2201.0	~2201.0		1.54	
410	MHz	2201.0	2201.0	~2201.0		1.85	
245	MHz	2158.0	2204.0	2205.0		1.76	
DS II	UE	2153		2157	110-170	1	
DS IV		2158		2214	30-220	1	
DS III	S,C	2157		2221	20-180	1	
DS III	B	2206		2206	27-90	2	
DS III	G	2218		2218	20-90	3	
CME		2206	1478 km/s				



PART 2. Event 2005.07.31 – (2005-212)

Particle event: To(Ep>10MeV) – 31d22^h

Tmax₁(Ep>10MeV) – 01d05^h, Jmax₁(Ep>10MeV) – 21 /cm².s.sr

Tmax₂(Ep>10MeV) – 02d01^h, Jmax₂(Ep>10MeV) – 6 /cm².s.sr

Duration of the event – 5 days

Maximum recorded proton energy of the event – Emax₁ = 70 MeV

– Emax₂ = 65 MeV

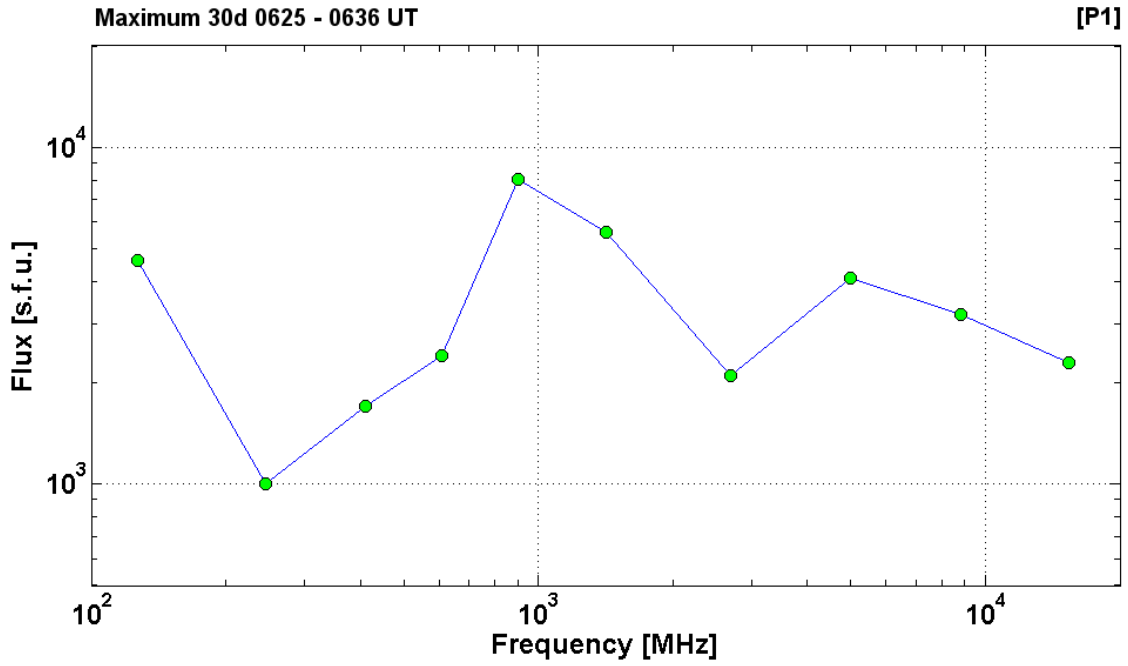
Sources: ● solar flare 30d06^h08^m, 2N/X1.3, N11E59, AR10792

∅ solar flare 01d13^h00^m, M1.0/1F, N14E29, AR10792

Main X-ray burst 1–8 Å: onset – 30d06^h17^m, max – 30d06^h35^m, Φ = 0.23 J/m²

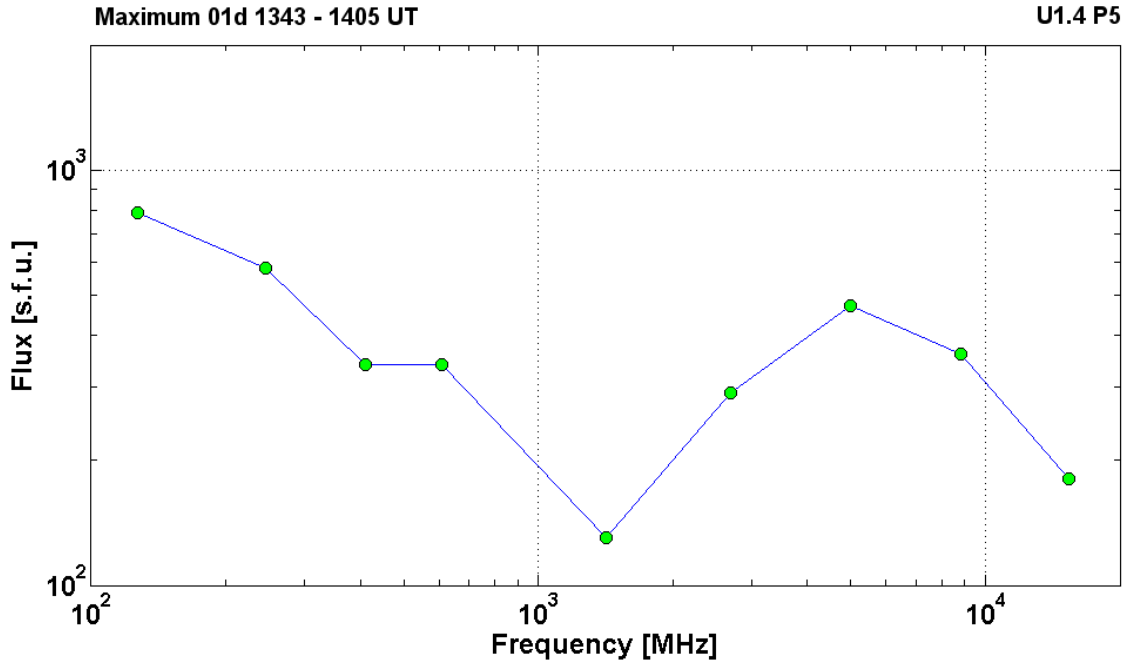
CME: 30d06^h50^m, V = 1968 km/s, Δφ = 360°, dA = 050°.

2005	July 30	●	AR10792	To event 468			
Hα	6563 Å	0608	0625	0823	N11E59	2N	UZ
1 – 12	keV	0617	0635	0701		X1.3	2.3E-1
100-300	keV	062740	063042	071348		82189624	HESSI
6-12	keV	081736	081902	081908		48672	HESSI
12-25	keV	091808	082118	082312		131232	HESSI
15.4	GHz	0621.0	0625.0	0704.0		3.36	
8.8	GHz	0620.0	0632.0	0715.0		3.51	
5	GHz	0619.0	0632.0	0754.0		3.61	
2.7	GHz	0619.0	0636.0	0754.0		3.32	
1.4	GHz	0621.0	0625.0	0716.0		3.75	
900	MHz	0543.5	0626.1	0848.0	[P1]	3.91	
610	MHz	0621.0	0626.0	0720.0		3.38	
410	MHz	0621.0	0626.0	0719.0		3.23	
245	MHz	0621.0	0632.0	0641.0		3.00	
127	MHz	<0630.0	0633.4	>0642.0		3.66	
DS II	SH	0626		0640	20-180	3	
DS IV	P,S	0621		0847	200-4000	3	
DS IV		0634		0734	25-180	2	
DS III	GG	0626		0634	18-180	3	
DS DCIM	GG	0619		0803	2000-4500	3	
CME		0650	1968 km/s	-102.6 km/s ²	360°	050°	



2005	August 01	ø		AR10792		To event 468	
H α	6563 Å	1315	1340	1436	N14E29	1F	EF
1 – 12	keV	1300	1351	1429		M1.0	2.9E-2
6-12	keV	130244	130250	130820		3064	HESSI
12-25	keV	130820	131718	132356		77104	HESSI
25-50	keV	132356	132950	133448		263876	HESSI
15.4	GHz	1329.0	1343.0	1416.0		2.26	
8.8	GHz	1328.0	1343.0	1411.0		2.56	
5	GHz	1328.0	1343.0	1416.0	U1.4 P5	2.67	
2.7	GHz	1329.0	1347.0	1416.0		2.46	
1.4	GHz	1341.0	1347.0	0000.0		2.11	
610	MHz	1342.0	1343.0	1349.0		2.53	
410	MHz	1341.0	1350.0	1418.0		2.53	
245	MHz	1345.0	1349.0	1418.0		2.76	
127	MHz	1355.0	1405.6	1425.0		2.90	
DS II		1349		1359	200-500	3	
DS IV		1349		1743	25-180	1	
DS DCIM	P	1409		1419	200-1600	3	

CME		1430	0984 km/s	17.9 km/s ²	093°	068°	
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PART 2. Event 2005.08.22 – (2005-234)

Particle event: To(Ep>10MeV) – 22d03^h

Tmax(Ep>10MeV) – 22d07^h, Jmax (Ep>10MeV) – 5.4 /cm².s.sr

Duration of the event – 0.7 day

Maximum recorded proton energy of the event – Emax₁ = 80 MeV

Sources: • solar flare 22^d00^h44^m, M2.6/1F, S09W48, AR10798

Main X-ray burst 1–8 Å: onset – 22d00^h44^m, max – 22d01^h33^m, Φ = 0.0096 J/m²

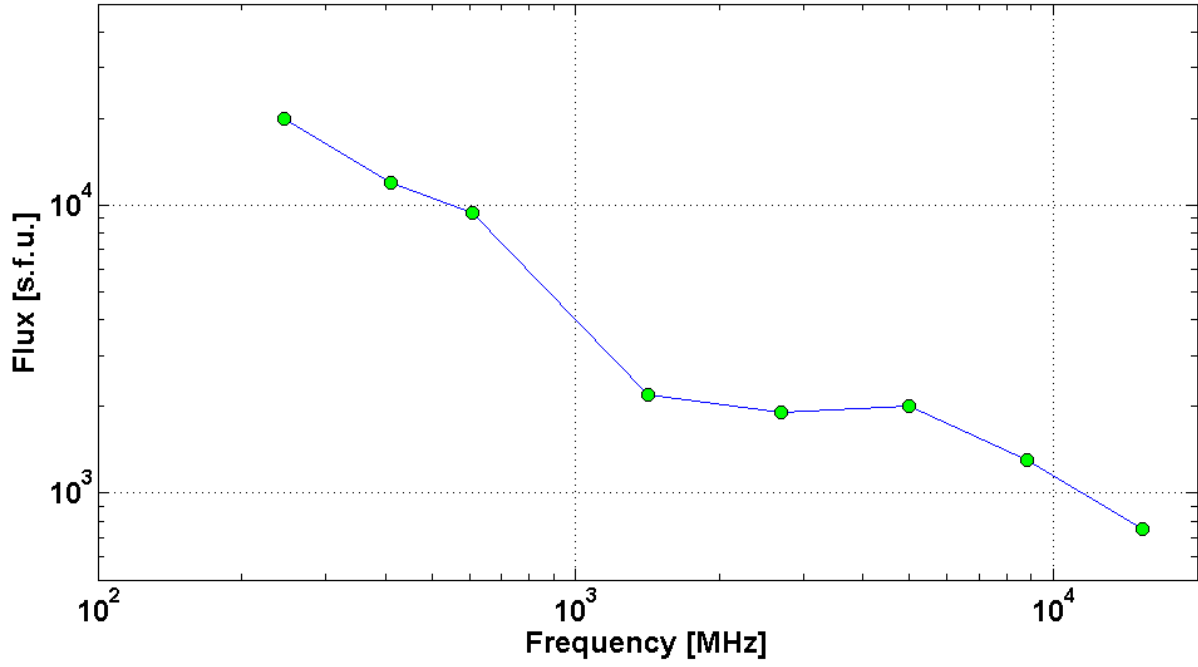
CME: 22d01^h32^m, V=1194 km/s, Δφ = 360°, dA= 220°

2005 August 22		• AR10798				To event 469	
Hα	6563 Å	0104	0117	0300	S09W48	1F	FH
1 – 12	keV	0044	0133	0218		M2.6	9.6E-3
25-50	keV	010148	012134	020240		31078596	HESSI
6-12	keV	023752	023846	031408		707931	HESSI
15.4	GHz	0053.0	0122.0	0000.0		2.88	
8.8	GHz	0054.0	0124.0	0301.0		3.11	
5	GHz	0051.0	0124.0	0301.0		3.30	
2.7	GHz	0051.0	0124.0	0245.0		3.28	
1.4	GHz	0053.0	0137.0	0219.0		3.34	
610	MHz	0050.0	0138.0	0257.0		3.97	
410	MHz	0051.0	0138.0	0000.0		4.08	
245	MHz	0054.0	0140.0	0000.0	[0.2 \ 15]	4.30	
DS II		0054		0110	90-430	1	
DS II	SH	0102		0108	30-60	3	
DS IV		0101		0315	50-1000	1	
DS IV	FS	0103		0316	25-180	3	
DS III	GG	0101		0122	20-90	3	
DS III	G	0130		0135	20-50	3	
410	MHz	0051.0	0204.0	0402.0		4.38	
245	MHz	0054.0	0205.0	0000.0		4.89	
CME		0132	1194 km/s	-17.8	360°	220°	

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Maximum 22d 0122 - 0140 UT

[0.2 \ 15]



PART 2. Event 2005.08.22a – (2005-234a)

Particle event: To(Ep>10MeV) – 22d19^h

Tmax₁(Ep>10MeV) – 23d02^h, Jmax₁(Ep>10MeV) – 280 /cm².s.sr

Tmax₂(Ep>10MeV) – 23d10^h, Jmax₂(Ep>10MeV) – 290 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 330 MeV

– Emax₂ = 300 MeV

Sources: ● solar flare 22d16^h46^m, M5.6/1N, S12W60, AR10798

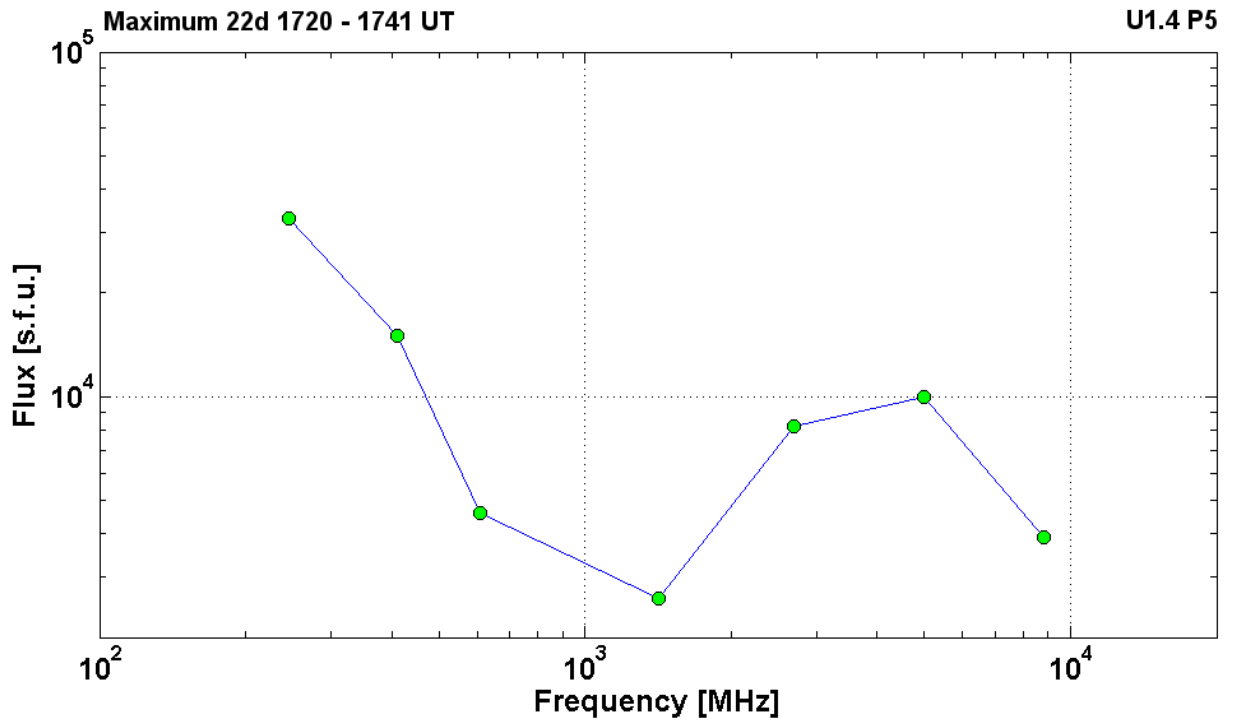
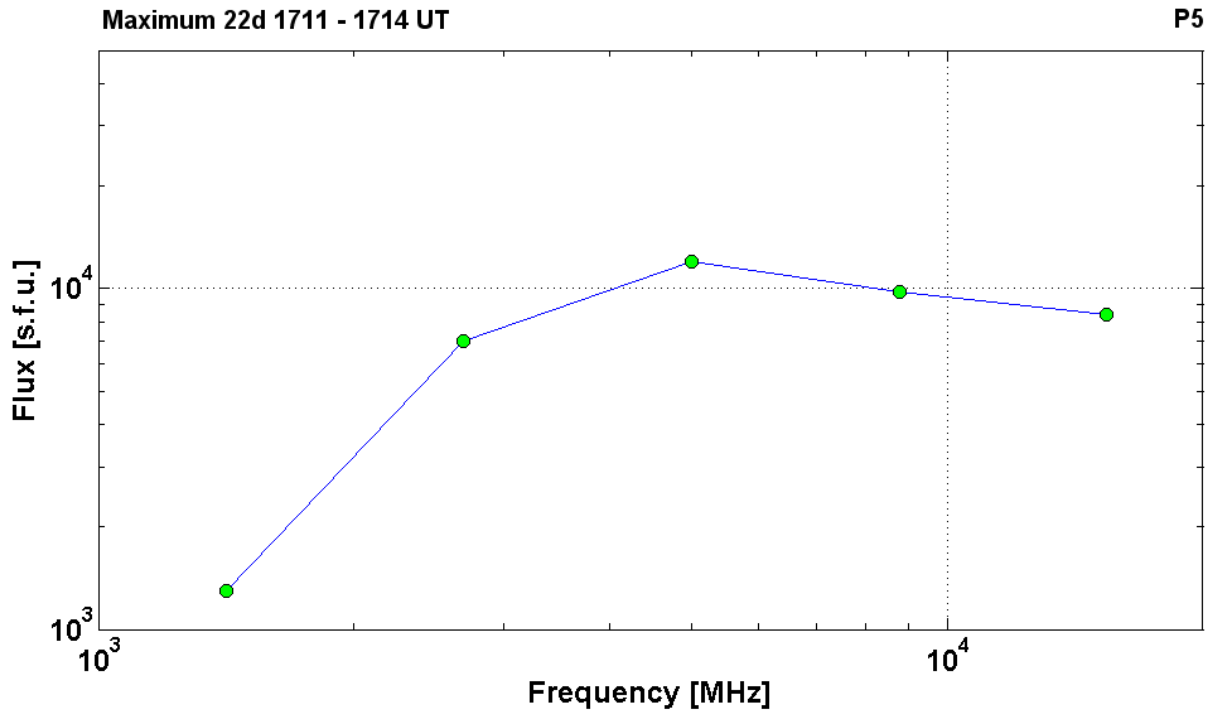
Main X-ray burst 1–8 Å: onset – 22d16^h46^m, max – 22d17^h27^m, Φ = 0.17 J/m²

CME: 17^h30^m, V=2378 km/s, Δφ = 360°, dA= 227°;

▲ SC 24d06^h13^m

2005	August 22	●	AR10798	To event 470			
Hα	6563 Å	1652	1711	1845	S12W60	1N	FU
1 – 12	keV	1646	1727	1802		M5.6	1.7E-1
100-300	keV	170116	171610	174320		67140128	HESSI
6-12	keV	183712	183838	191308		301914	HESSI
15.4	GHz	1707.0	1711.0	2006.0		3.92	
8.8	GHz	1707.0	1711.0	2014.0		3.99	
5	GHz	1649.0	1711.0	1717.0		4.08	
2.7	GHz	1649.0	1713.0	1717.0		3.85	
1.4	GHz	1651.0	1714.0	1717.0	P5	3.11	
DS IV	P	1652		1737	100-4000	3	
DS IV		1654		2145	30-180	3	
8.8	GHz	1654.0	1721.0	1915.0		3.59	
5	GHz	1654.0	1721.0	1936.0	U1.4 P5	4.00	
2.7	GHz	1654.0	1722.0	1937.0		3.91	
1.4	GHz	1654.0	1722.0	1921.0		3.41	
610	MHz	1655.0	1720.0	1907.0		3.66	
410	MHz	1655.0	1728.0	2035.0		4.18	
245	MHz	1656.0	1741.0	2035.0		4.52	
DS III		1720		1721	25-87	1	
CME		1730	2378 km/s	108.0km/s	360°	227°	

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PART 2. Event 2005.09.07 – (2005-250)

Particle event: To(Ep>10MeV) – 07d21^h

Tmax₁(Ep>10MeV) – 08d20^h, Jmax₁(Ep>10MeV) – 70 /cm².s.sr

Tmax₂(Ep>10MeV) – 10d11^h, Jmax₂(Ep>10MeV) – 1000 /cm².s.sr

Duration of the event – 5 days

Maximum recorded proton energy of the event – Emax₁ = 800 MeV

– Emax₂ = 560 MeV

Sources: ● solar flare 07d17^h17^m, X17.0/3B, S06E89, AR10808

Ø solar flare 08d20^h52^m, X5.4/2B, S11E74, AR10808

Ø solar flare 09d09^h42^m, X3.6/1N, S12E62, AR10808

Ø solar flare 09d19^h13^m, X6.2/2B, S12E67, AR10808 *

Main X-ray burst 1–8 Å: onset – 07d17^h17^m, max – 07d17^h40^m, Φ = 2.6 J/m²

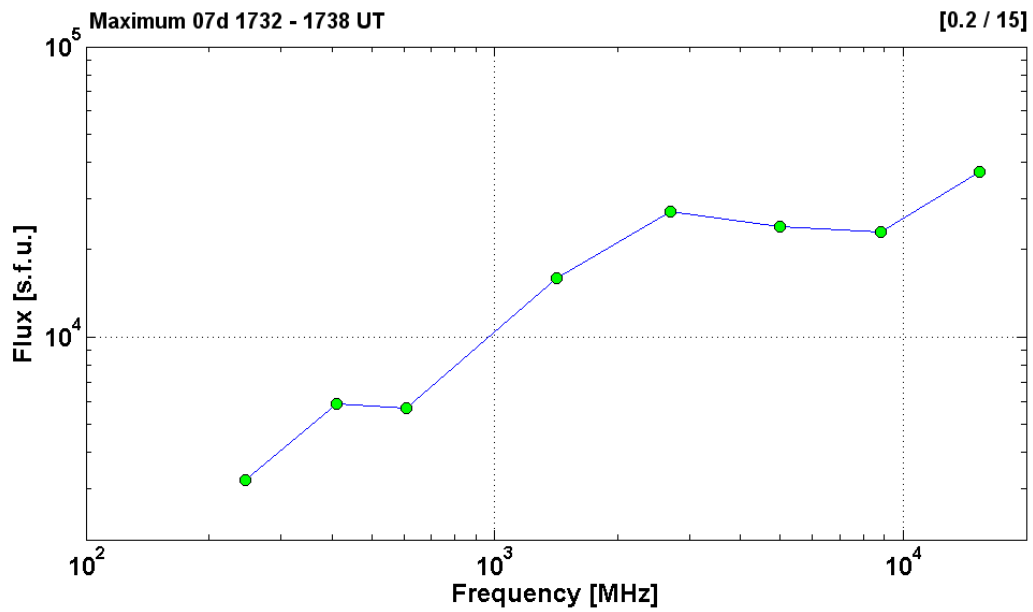
CME: gap

▲ SC 09d14^h01^m; ▲ SC 11d01^h14^m;

* – localisation on the X-ray burst

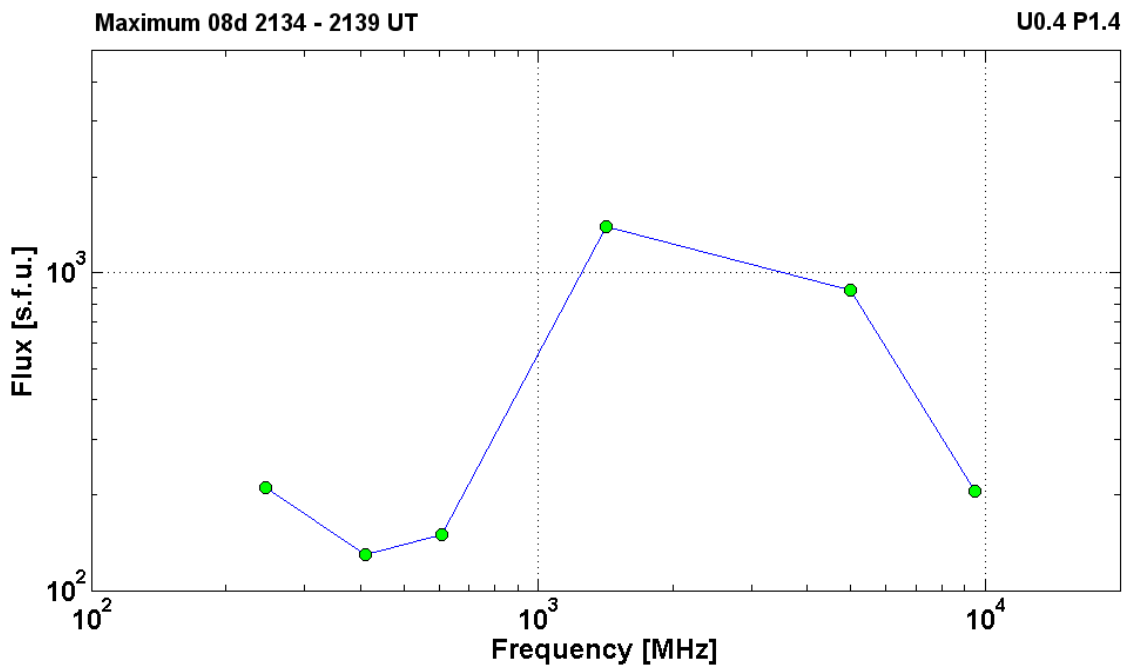
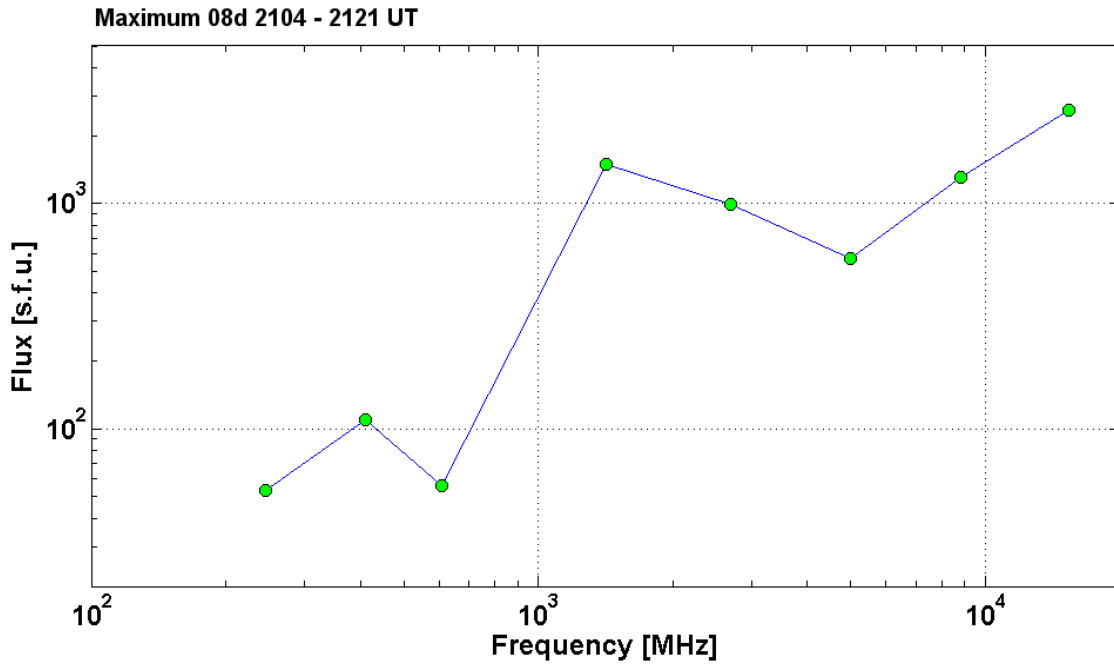
2005 September 07 ● AR10808 To event 471

H _α	6563 Å	1724	1740	1847	S06E89	3B	MY
1 – 12	keV	1717	1740	1803		X17.0	2.6E00
6-12	keV	171104	171334	171752		585282	HESSI
50-100	keV	174244	174346	174704		3848547	HESSI
50-100	keV	181904	182002	182752		21973536	HESSI
25-50	keV	182752	183230	185936		52805952	HESSI
15.4	GHz	1723.0	~1736.0	1902.0	[0.2 / 15]	4.57	
8.8	GHz	1723.0	~1736.0	1902.0		4.36	
5	GHz	<1725.0	~1736.0	>1902.0		4.38	
2.7	GHz	<1728.0	~1736.0	>1910.0		4.43	
1.4	GHz	<1729.0	~1732.0	>1905.0		4.20	
610	MHz	1732.0	~1738.0	1853.0		3.76	
410	MHz	1733.0	~1736.0	1843.0		3.77	
245	MHz	1735.0	~1737.0	1841.0		3.51	
DS II		1742		1750	25-180	3	
DS IV		1750		1846	25-180	2	
CME							gap

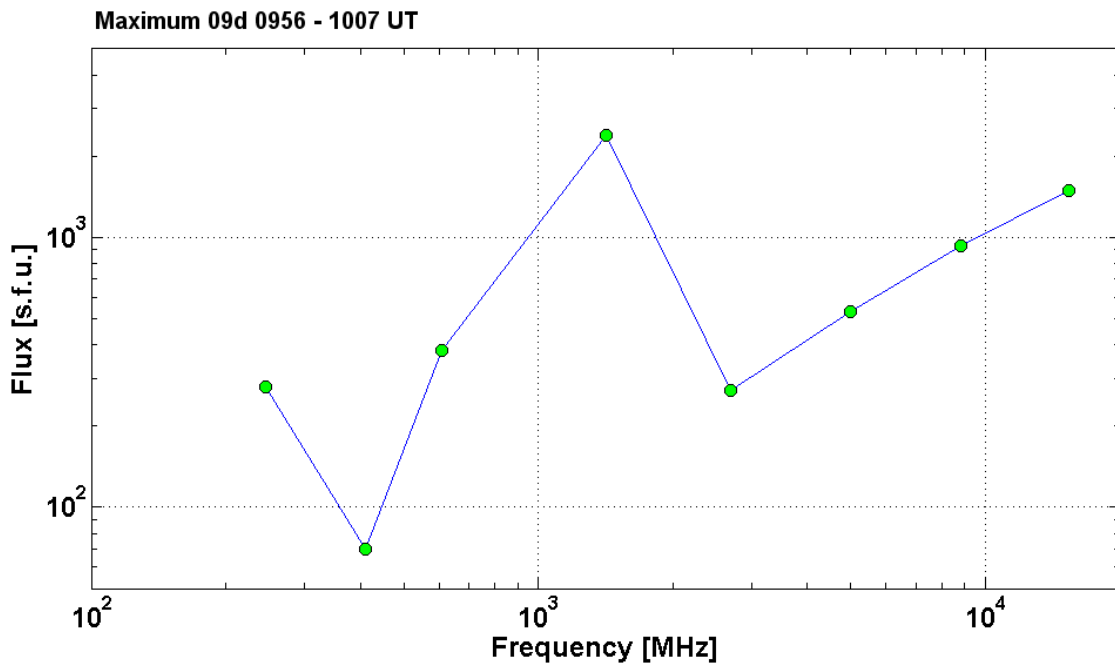


2005	September 08	Ø			AR10808	To event 471	
H _α	6563 Å	2052	2105	0042	S11E74	2B	MU
1 – 12	keV	2052	2106	2117		X5.4	3.8E-1
25-50	keV	213016	213118	222056		9633607	HESSI
12-25	keV	223324	223334	223424		19872	HESSI
12-25	keV	230632	230654	234616		457791	HESSI
6-12	keV	234616	234654	000208		78348	HESSI
15.4	GHz	2026.0	2107.0	2148.0		3.41	
8.8	GHz	2053.0	2105.0	2142.0		3.11	
5	GHz	2101.0	2105.0	0000.0		2.76	
2.7	GHz	2102.0	2104.0	0000.0		3.00	
1.4	GHz	2105.0	2106.0	2145.0		3.18	
610	MHz	2111.0	2111.0	~2111.0		1.75	
410	MHz	2114.0	2114.0	2121.0		2.04	
245	MHz	2121.0	2121.0	~2121.0		1.72	
DS IV		2116		2337	25-300	1	
DS III	N	2110		2131	30-180	1	
DS III	G	2110		2112	40-200	3	
9.5	GHz	2135.2	2139.2	2143.1		2.31	
5	GHz	2101.0	2135.0	2143.0		2.94	
1.4	GHz	<2104.0	2137.0	>2146.0	U0.4 P1.4	3.15	
610	MHz	2111.0	2135.0	2138.0		2.18	
410	MHz	2114.0	2137.0	2151.0		2.11	

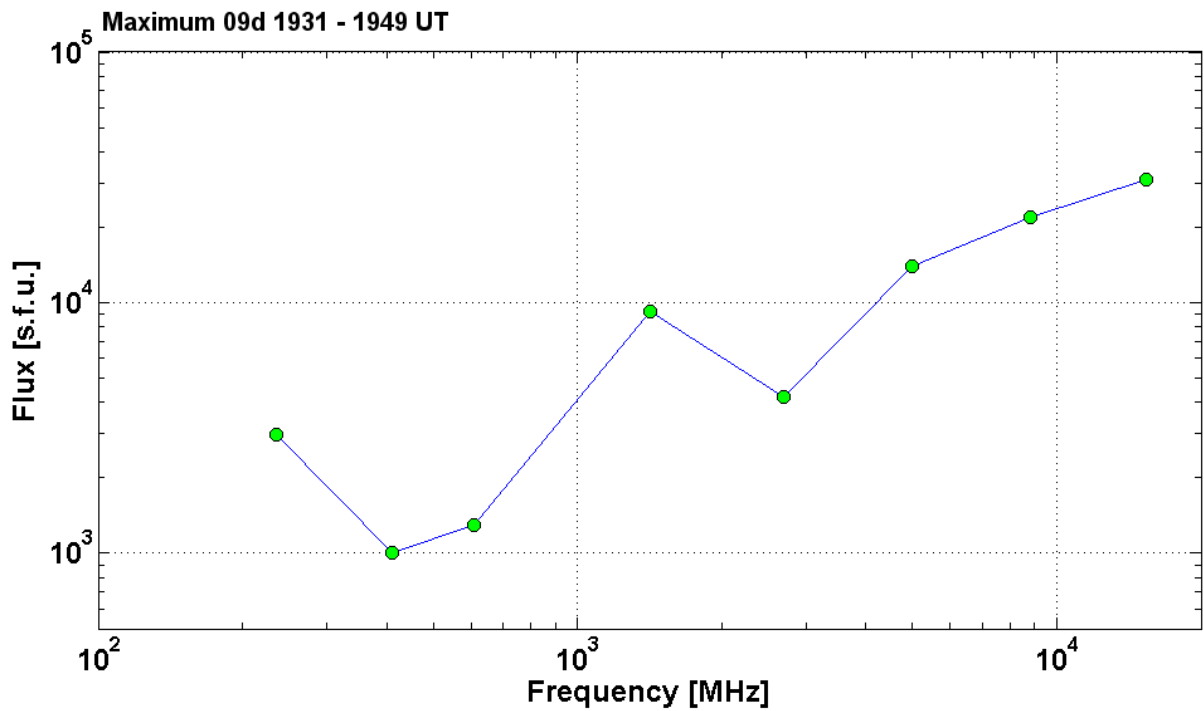
245	MHz	2122.0	2134.0	2203.0		2.32	
DS IV	FS	2132		>2400	23-57	2	
DS IV		2244		0344	38-180	2	
DS III	N	2130		>2400	20-57	1	
CME							gap



2005	September 09	Ø			AR10792	To event 471	
H _α	6563 Å	<1020	-	1115	S12E62	2B	MU
1 - 12	keV	0942	0959	1008		X3.6	2.3E-1
25-50	keV	092524	094602	094636		279628	HESSI
12-25	keV	101800	101854	103316		2530704	HESSI
12-25	keV	110024	110042	110848		32808	HESSI
12-25	keV	110848	110914	112040		33560	HESSI
15.4	GHz	0953.0	0956.0	1024.0		3.18	
8.8	GHz	0952.0	0956.0	1019.0		2.97	
5	GHz	0953.0	0956.0	1019.0		2.72	
2.7	GHz	0954.0	0956.0	1012.0		2.43	
1.4	GHz	0957.0	1005.0	1011.0		3.38	
610	MHz	1000.0	1001.0	1011.0		2.58	
410	MHz	1006.0	1007.0	1007.0		1.85	
245	MHz	1006.0	1006.0	1025.0		2.45	
DS IV	P	0954		1024	100-4000	3	
DS III		1025		1025	50-180	2	
DS DCIM	GG	0952		1026	2000-4500	3	
DS DCIM	GG,FS	0954		1026	800-2000	3	
CME							gap



2005	September 09	Ø			AR10808	To event 471	
H α	6563 Å	No Flare			S12E67		
1 – 12	keV	1913	2004	2036		X6.2	1.7E00
12-25	keV	191908	192146	192240		604126	HESSI
50-100	keV	205652	205658	205840		531774	HESSI
15.4	GHz	1916.0	1947.0	2147.0		4.49	
8.8	GHz	1916.0	1948.0	0000.0		4.34	
5	GHz	1916.0	~1949.0	2143.0		4.15	
2.7	GHz	1921.0	~1949.0	2142.0		3.62	
1.4	GHz	1905.0	1931.0	0000.0		3.96	
610	MHz	1929.0	1945.0	0000.0		3.11	
410	MHz	1925.0	~1945.0	2036.0		3.00	
235	MHz	1931.9	~1931.9	2048.0		>3.47	
DS II		1934		1949	25-180	2	
DS IV		1934		2123	30-180	3	
CME		1948	2257 km/s	-128.6 km/s ²	360°	220°	



PART 2. Event 2005.09.14 – (2005-257)

Particle event: To(Ep>10MeV) – 14d00^h

Tmax₁(Ep>10MeV) – 14d15^h, Jmax₁(Ep>10MeV) –160 /cm².s.sr

Tmax₂(Ep>10MeV) – 15d08^h, Jmax₂(Ep>10MeV) –180 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax₁ = 90 MeV

– Emax₂ = 85 MeV

Sources: ● solar flare 13d19^h19^m, X1.5/2B, S09E10, AR10808*

13d23^h15^m, X1.7/2B, S09E10, AR10808*

∅ solar flare 15d08^h30^m, X1.1/2N, S11W15, AR10808

Main X-ray burst 1–8 Å: onset – 13d19^h19^m, max – 13d19^h27^m, Φ = 0.55 J/m²

CME: 13d20^h00^m, V = 1866 km/s, Δφ = 360°, dA = 149°

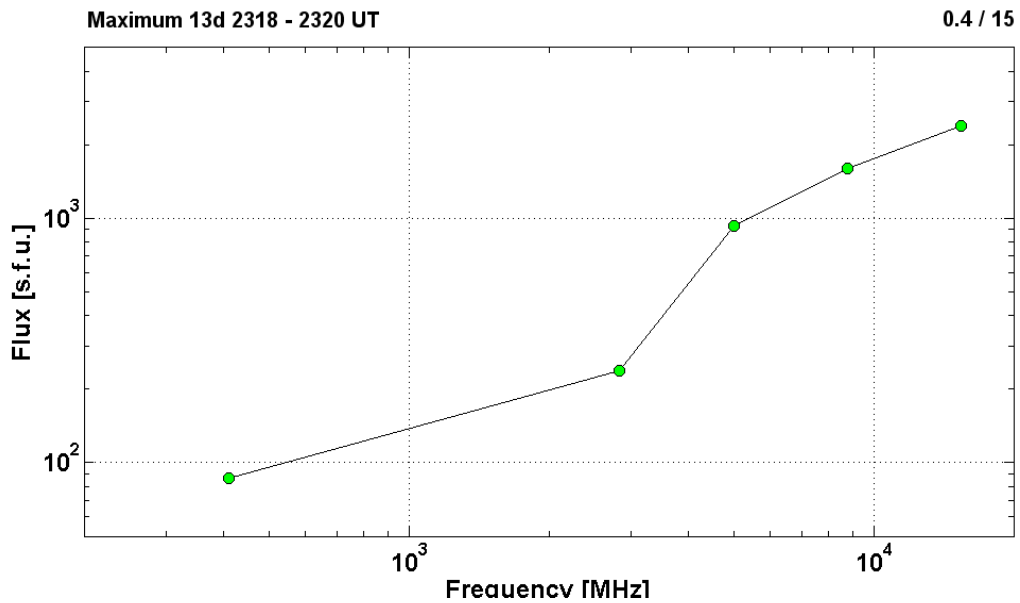
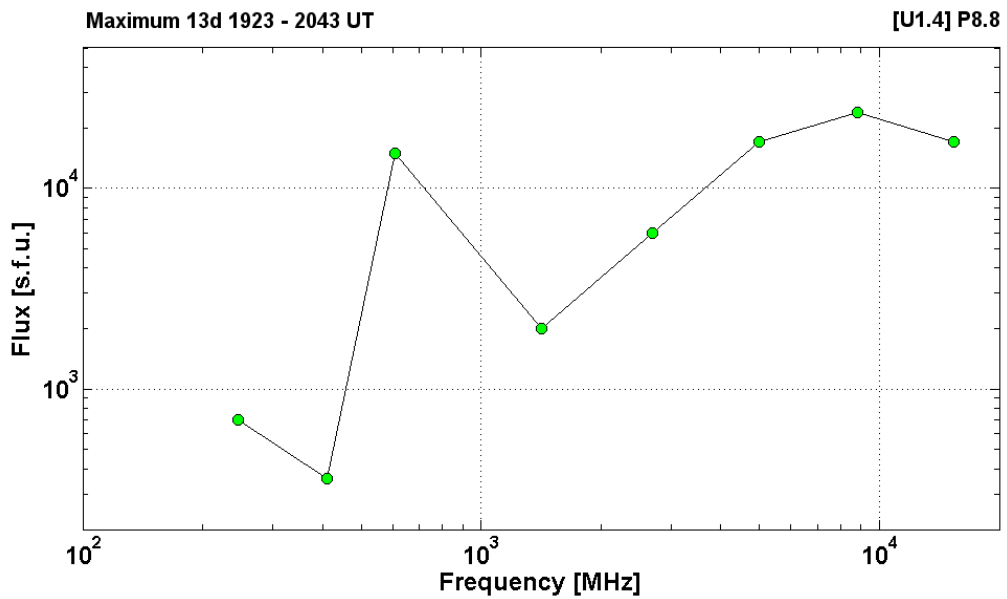
▲ SC 15d08^h35^m; ▲ SC 15d09^h04^m;

* – One solar flare event with two X-ray burst

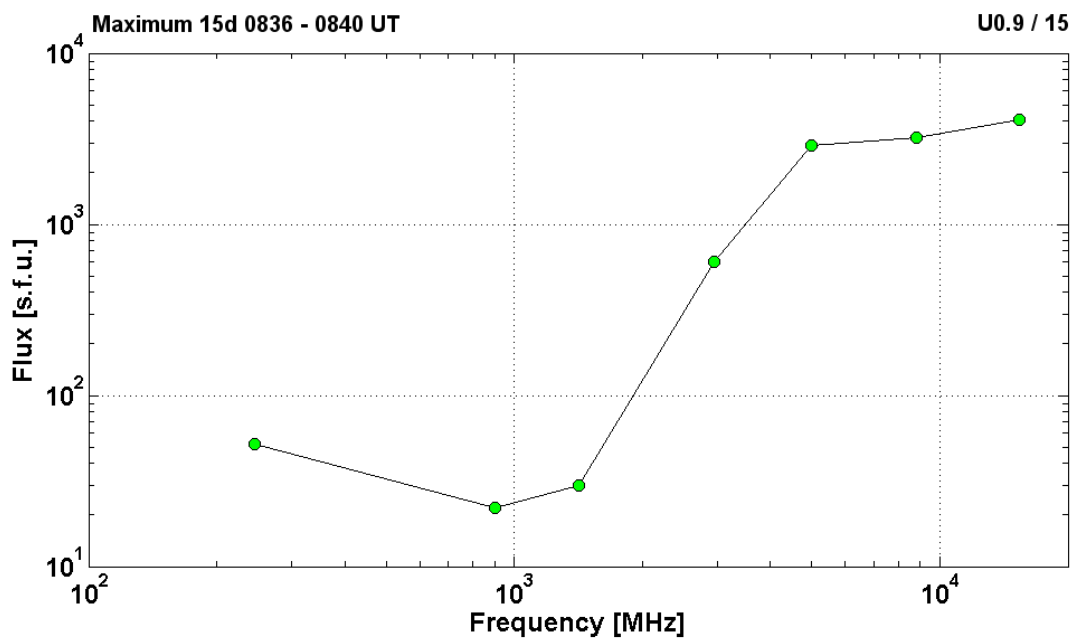
2005 September 13 ● AR10808 To event 472

Hα	6563 Å	1922	1923	0021	S09E10	2B	FU
1 – 12	keV	1919	1927	2057		X1.5	5.5E-1
1 – 12	keV	2315	2322	2330		X1.7	9.3E-2
25-50	keV	195252	195822	201344		21140692	HESSI
12-25	keV	201344	201510	202224		5285486	HESSI
100-300	keV	202224	203254	203316		6368830	HESSI
50-100	keV	204308	204330	205716		5777847	HESSI
12-25	keV	212900	213046	215352		1368541	HESSI
12-25	keV	215352	215638	221632		912288	HESSI
12-25	keV	230456	230522	231052		116139	HESSI
6-12	keV	231052	321234	231500		47715	HESSI
100-300	keV	231500	232150	000540		22934672	HESSI
15.4	GHz	<1922.0	1923.0	>2131.0		4.23	
8.8	GHz	<1921.0	1923.0	>2129.0	[U1.4] P8.8	4.38	
5	GHz	1921.0	1923.0	0000.0		4.23	
2.7	GHz	1922.0	1923.0	2137.0		3.78	
1.4	GHz	<1922.0	2021.0	>2135.0		3.30	
610	MHz	1929.0	2015.0	2059.0		4.18	
410	MHz	1937.0	2029.0	2153.0		2.56	
245	MHz	1930.0	2043.0	2157.0		2.85	
DS IV		<2010		>2400	20-57	3	
DS III		1950		1951	25-180	2	
DS III	N	2027		0422	25-135	1	
DS III	B	2041		2041	25-57	3	
DS V		1950		1951	30-180	2	

15.4	GHz	2317.0	2318.0	0000.0	0.4 / 15	3.38	
8.8	GHz	2317.0	2320.0	0000.0		3.20	
8.8	GHz	2317.0	2320.0	2337.0		3.20	
5	GHz	2318.0	2320.0	2330.0		2.97	
2.8	GHz	2314.0	2320.5	2354.0		2.37	
410	MHz	2319.0	2320.0	2321.0		1.93	
CME		2000	1866 km/s	11.5 km/s ²	360°	149°	
CME		2336	0999 km/s	-13.9 km/s ²	046°	158°	



2005	September 15	Ø			AR10808	To event 472	
H α	6563 Å	0834	0837	0953	S11W15	2N	FZ
1 – 12	keV	0830	0838	0846		X1.1	5.6E-2
3-6	keV	08:40:28	08:41:10	08:42:24		1256426	HESSI
6-12	keV	08:42:24	09:11:22	09:34:04		646872	HESSI
15.4	GHz	0834.0	0836.0	0932.0	U0.9 / 15	3.61	
8.8	GHz	0834.0	0836.0	0922.0		3.51	
5	GHz	0834.0	0836.0	0932.0		3.46	
3	GHz	0834.5	0836.8			2.78	
1.4	GHz	0836.0	0836.0	0000.0		1.48	
900	MHz	0835.1	0838.1	0840.3		1.34	
245	MHz	0840.0	0840.0	~0840.0		1.72	
DS DCIM	G	0834		0849	2000-4500	3	
DS DCIM	C	0835		0842	1000-4000	3	
CME							gap



PART 2. Event 2006.12.05 – (2006-339)

Particle event: To(Ep>10MeV) – 05d15^h

Tmax(Ep>10MeV) – 05d20^h, Jmax(Ep>10MeV) – 2.5 /cm².s.sr

Duration of the event – 1 day

Maximum recorded proton energy of the event – Emax = 275 MeV

Sources: • solar flare 05^d 10^h 18^m, X9/2N, S07E79 AR10930;

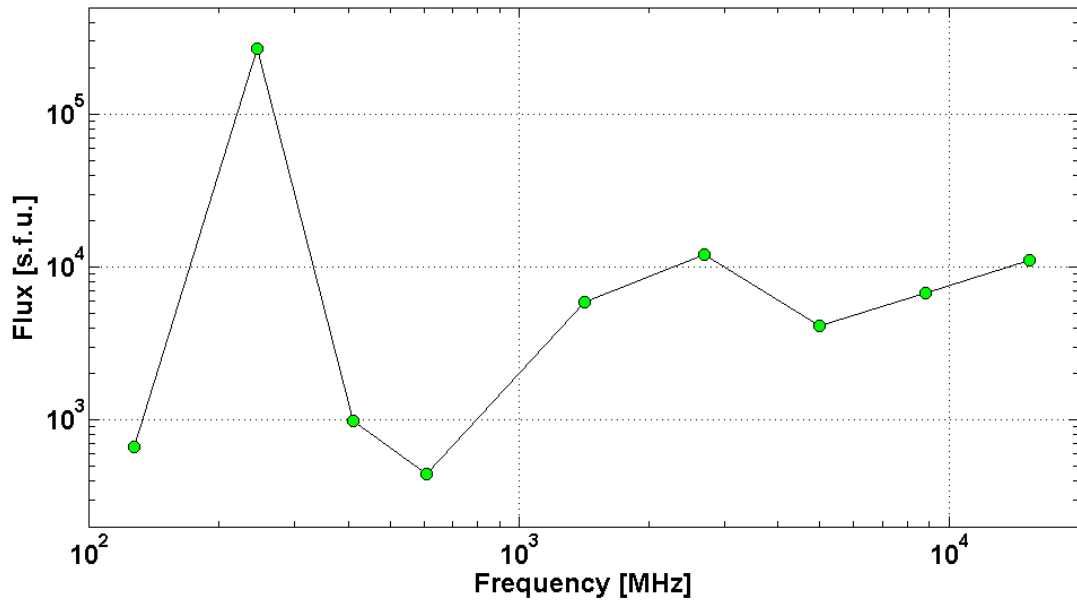
Main x-ray burst 1–8 Å: onset – 05d10^h18^m, max – 05d 10^h35^m, Φ = 0,71 J.m⁻²

CME: gap

2006	December 05	• AR10808			To event 473		
Hα	6563 Å	1028	1038	1100	S07E79	2N	F
1 – 12	keV	1018	1035	1045		X9.0	7.1E-01
25-50	keV	103032	103938	114424		87206176	HESSI
15.4	GHz	1025.0	1030.0	1105.0	P0.2 U0.6[P2.7 U 5]/15	4.04	
8.8	GHz	1025.0	1030.0	1058.0		3.83	
5	GHz	1025.0	1030.0	1057.0		3.61	
2.7	GHz	1024.0	1029.0	1056.0		4.08	
1.4	GHz	1027.0	1030.0	1037.0		3.77	
610	MHz	1027.0	1028.0	1044.0		2.64	
410	MHz	1026.0	1029.0	1059.0		2.99	
245	MHz	1027.0	1027.0	1105.0		5.43	
127	MHz	1026.0	1032.2	1042.0		2.83	
DS II	H	1028		1036	100-300	3	
DS II		1034		1039	38-73	3	
DS IV		1034		1054	25-180	2	
DS III	GG,RS	1026		1033	110-400	3	
DS III		1027		1034	25-180	2	
DS DCIM	P	1025		1234	100-4000	3	
CME							gap

Maximum 05d 1027 - 1032 UT

P0.2 U0.6 [P2.7 U 5] /15



PART 2. Event 2006.12.06 – (2006-340)

Particle event: $T_0(E_p > 10 \text{ MeV}) - 10^h$

$T_{\text{max}}(E_p > 10 \text{ MeV}) - 7^d 22^h$, $J_{\text{max}}(E_p > 10 \text{ MeV}) - 1860 / \text{cm}^2 \cdot \text{s} \cdot \text{sr}$

Duration of the event – 6 days

Maximum recorded proton energy of the event – $E_{\text{max}} = 850 \text{ MeV}$

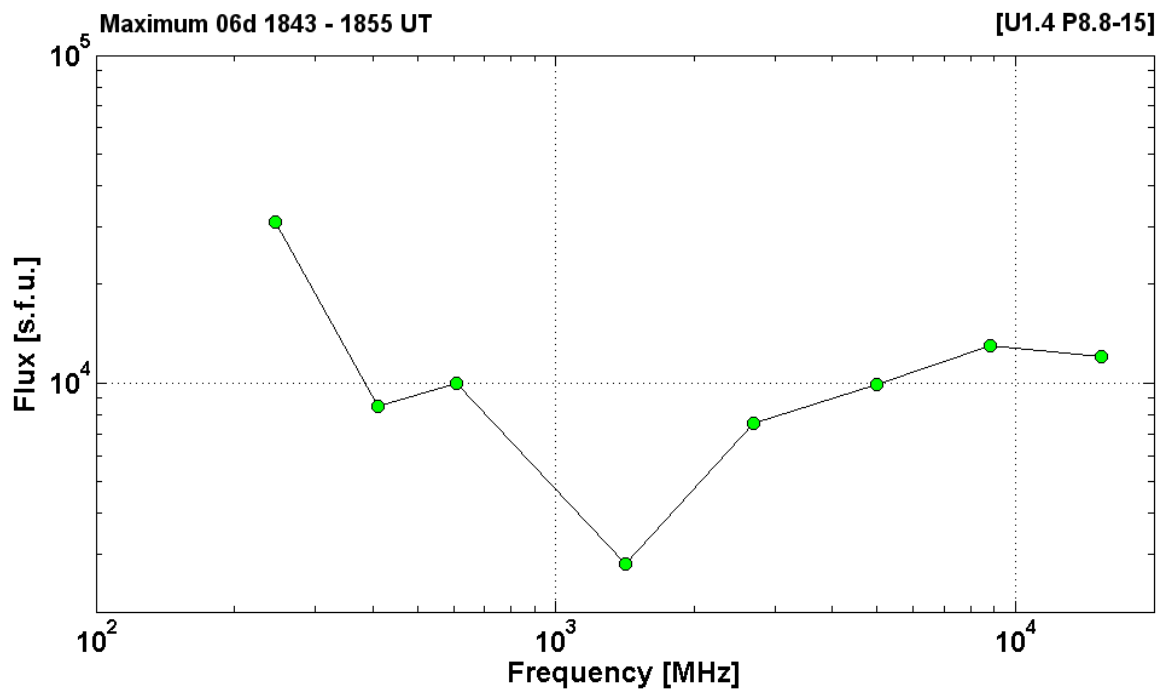
Sources: • solar flare 06d18^h29^m, X6.5/3B, S06E63 AR10930

Main x-ray burst 1–8 Å: onset – 06d 18^h 29^m, max – 06d18^h47^m, $\Phi = 0.480 \text{ J/m}^2$

CME: 06d20^h12^m, $V = \dots \text{ km/s}$, $\Delta\phi = 360^\circ$, $dA = 135^\circ$.

▲ SC 08d 0435

2006	December 06	•			AR10930	To event 474	
H α	6563 Å	1832	1845	2135	S06E63	3B	FZ
1 – 12	keV	1829	1847	1900		X6.5	4.8E-1
300 800	keV	183232	184526	192232		60269264	HESSI
6-12	keV	200740	200810	201332		120125	HESSI
25-50	keV	201332	201746	204628		1984508	HESSI
6-12	keV	204628	204750	204956		22362	HESSI
6-12	keV	20495	205042	205436		26997	HESSI
15.4	GHz	1838.0	1847.0	1937.0	[U1.4 P8.8-15]	4.08	
8.8	GHz	1833.0	1855.0	1959.0		4.11	
5	GHz	1832.0	1855.0	1959.0		4.00	
2.7	GHz	1842.0	1855.0	0000.0		3.88	
1.4	GHz	1841.0	1847.0	0000.0		3.45	
610	MHz	1842.0	1843.0	0000.0		4.00	
410	MHz	1844.0	1845.0	0000.0		3.93	
245	MHz	1844.0	1844.0	1855.0		4.49	
DS II		1842		1859	25-180	3	
DS IV		1844		1902	30-180	3	
DS III		1842		1844	30-180	2	
9.5	GHz	1916.2	1917.2	1959.6		2.79	
1.4	GHz	1842.0	1917.0	0000.0		5.18	
610	MHz	1844.0	1918.0	0000.0		4.28	
CME		2012	–	–	360°	135°	



PART 2. Event 2006.12.13 – (2006-347) – GLE-70

Particle event: To(Ep>10MeV) – 13d03^h

Tmax(Ep>10MeV) – 13d09^h, Jmax (Ep>10MeV) – 660 /cm².s.sr

Duration of the event – 2 days

Maximum recorded proton energy of the event – Emax ≥ 3000 MeV

Sources: ● solar flare 13d02^h14^m, X3.4/4B, S06W24, AR10930

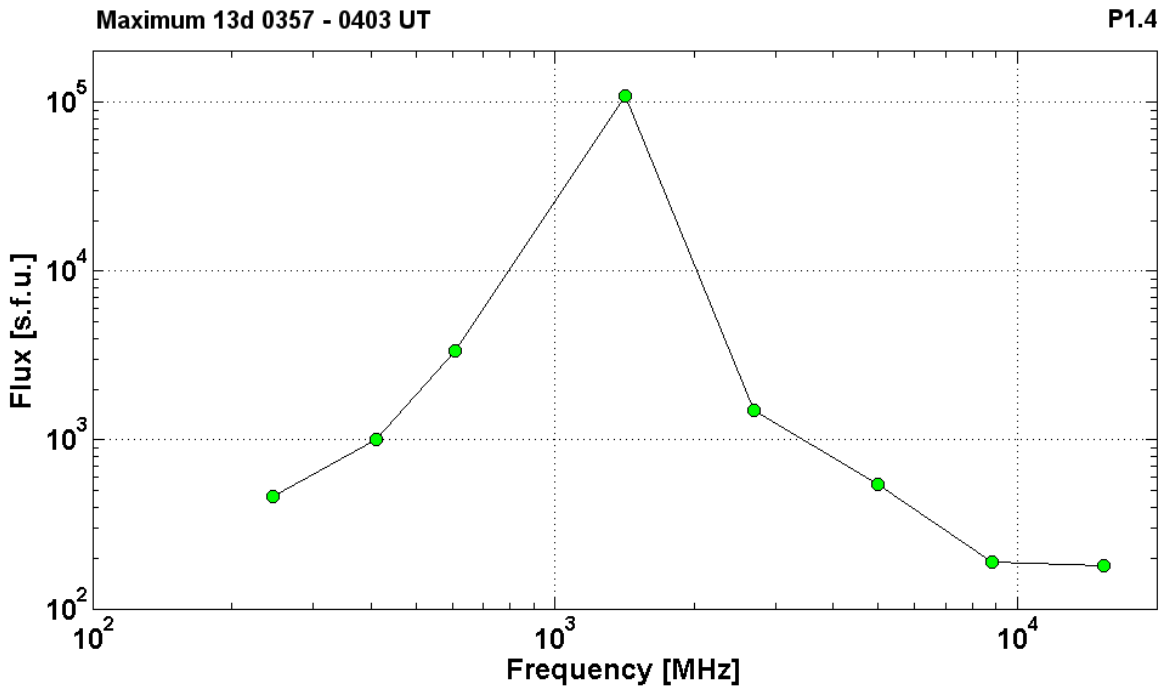
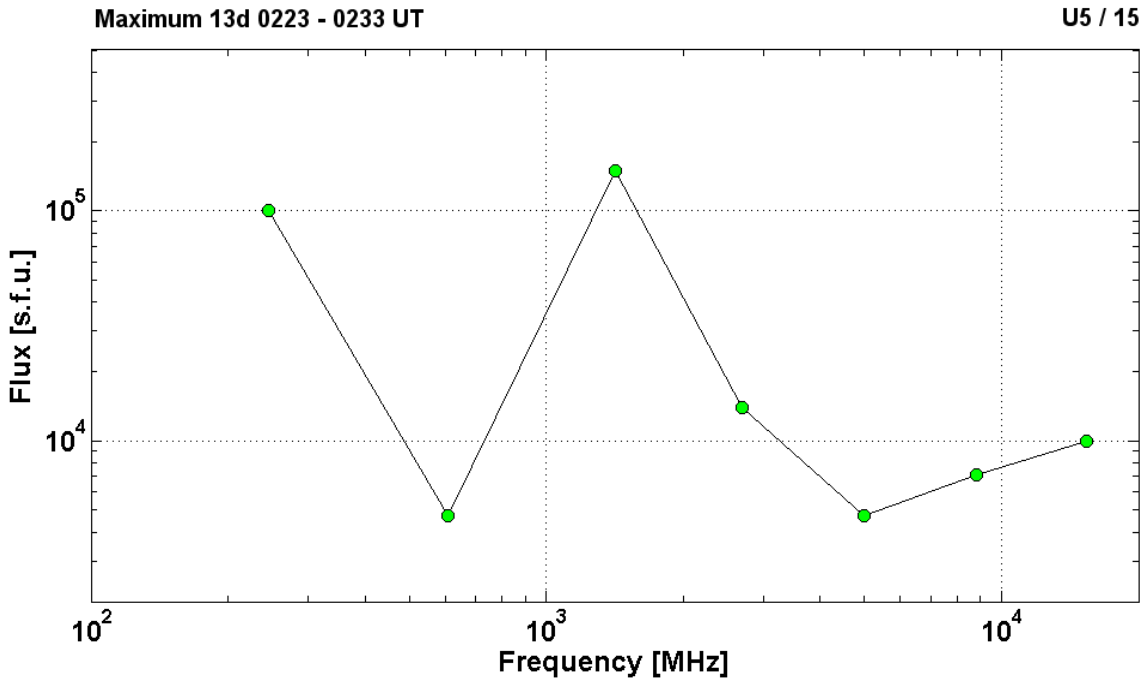
Main X-ray burst 1–8 Å: onset – 13d02^h14^m, max – 13d02^h40^m, Φ = 0.51 J/m²

CME: 13d02^h54^m, V = 1774 km/s, Δφ = 360°, dA = 193°;

▲SC 14d14^h14^m

2006	December 13	●			AR10930	To event 475	
Hα	6563 Å	0220	0234	0618	S06W24	4B	EF
1 – 12	keV	0214	0240	0257		X3.4	5.1E-1
100-300	keV	022812	02385	033104		248619072	HESSI
6-12	keV	040408	040518	050640		4424582	HESSI
6-12	keV	0540	054038	055724		2109604	HESSI
6-12	keV	055724	060234	063628		3159671	HESSI
15.4	GHz	0221.0	0229.0	0343.0	U5 / 15	4.00	
8.8	GHz	0221.0	0229.0	0325.0		3.85	
5	GHz	0222.0	0233.0	0326.0		3.67	
2.7	GHz	0222.0	0223.0	0000.0		4.15	
1.4	GHz	0223.0	0225.0	0326.0		5.18	
610	MHz	0223.0	0224.0	0000.0		3.67	
245	MHz	0224.0	0225.0	0326.0		5.00	
DS II		0227		0244	25-300	3	
DS IV		0225		0404	25-2000	3	
DS III	GG	0224		0233	18-1800	3	
DS V		0224		0226	25-180	3	
2.7	GHz	0222.0	0302.0	0326.0		4.81	
610	MHz	0223.0	0306.0	0326.0		5.08	
410	MHz	0224.0	0306.0	0326.0		4.30	
DS III	GG	0301		0307	160-1800	2	
DS III	G	0303		0307	25-120	1	
15.4	GHz	0356.0	0357.0	0402.0		2.26	
8.8	GHz	0356.0	0357.0	0359.0		2.28	
5	GHz	0355.0	0401.0	0404.0		2.74	
2.7	GHz	0355.0	0357.0	0404.0		3.18	
1.4	GHz	0355.0	0402.0	0404.0	P1.4	5.04	
610	MHz	0355.0	0359.0	0404.0		3.53	
410	MHz	0355.0	0403.0	0404.0		3.00	
245	MHz	0403.0	0403.0	~0403.0		2.66	

CME		0254	1774 km/s	-61.4 km/s ²	360°	193°	



PART 2. Event 2006.12.14 – (2006-348)

Particle event: To(Ep>10MeV) – 14d23^h

Tmax(Ep>10MeV) – 15d00^h, Jmax (Ep>10MeV) – 160 /cm².s.sr

Duration of the event – 3 days

Maximum recorded proton energy of the event – Emax ≥ 500 MeV

Sun source: ● solar flare 14d21^h07^m, X1.5/2B, S06W46, AR10930

Main X-ray burst 1-8 Å: onset – 14d21^h07^m, max – 14d22^h15^m, Φ = 0.12 J/m²

CME: 22^h30^m, V = 1042 km/s, Δφ = 360°, dA = 248°;

▲ SC 16d17^h55^m;

2006	December 14	●	AR10930	To event 476			
Hα	6563 Å	2206	2211	0011	S06W46	2B	EFZ
1 – 12	keV	2107	2215	2226		X1.5	1.2E-1
6-12	keV	213956	214734	214740		2839	HESSI
12-25	keV	215056	215606	215852		89395	HESSI
6-12	keV	215852	221954	222448		40619936	HESSI
6-12	keV	055724	231402	233000		784524	HESSI
12-25	keV	233000	233302	235708		458330	HESSI
12-25	keV	235708	235710	000728		78438	HESSI
15.4	GHz	2207.0	2209.0	0000.0		3.23	
8.8	GHz	2207.0	2211.0	2314.0	[U2.7] P8.8	3.40	
5	GHz	2206.0	2211.0	2316.0		3.18	
2.7	GHz	2207.0	2208.0	0000.0		2.79	
1.4	GHz	2207.0	2209.0	0000.0		4.04	
410	MHz	2207.0	2208.0	0000.0		2.68	
245	MHz	2209.0	2210.0	2227.0		3.08	
DS II		2209		2219	25-290	3	
DS IV		2207		2312	25-2000	2	
DS III	GG	2219		2226	18-90	3	
DS V		2218		2226	25-114	2	
2.7	GHz	2207.0	2228.0	2316.0		3.41	
1.4	GHz	2207.0	2307.0	2315.0	0.4 / 1.4	4.80	
610	MHz	2207.0	2302.0	2308.0		3.89	
410	MHz	2207.0	2247.0	2309.0		3.30	
DS III	GG	2244		2248	20-1300	1	
DS III	G	2301		2304	300-820	2	

Maximum 14d 2208 - 2211 UT

[U2.7] P8.8

