

Summary Table of Solar Proton Events in the 23rd Cycle of Solar Activity (1997-2006)

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Legend:

Event name-(yyyyymmdd-day-year month day-day of the year);

T₀ – the hour of the event beginning (UT), the event date coincides with the date in the event name;

T_{max} – time of the first (second and third if any) peak intensity, UT;

J_{max} – the flux of protons with energy ≥ 10 MeV in the first (second and third if any) maximum;

γ – power-law index of the integral spectrum ($J(>E) \sim E^{-\gamma}$);

E_{qm} – quasimaximal energy of proton in this event;

b/s – back side flare event;

W_{L-1d} – 1 day behind the W-limb;

DSF– the length of the rejected filament in the degrees;

Legend for solar flares is commonly accepted.

The following table shows all 142 events included in the Catalog of solar proton events in the 23rd cycle of solar activity

Particles enhancements						Solar flares or CME – the particle sources			
Event name	T ₀	T _{max}	J _{max} (pfu)	γ	E _{qm} , MeV	T _{Fl max} /T _{0 CME} / T _{0 SC} , (UT) *	Class of flare	Localizat ion	Active region
19971104-308	07 ^h	04d11 ^h 05d02 ^h 20	66 17.5	2.0 1.8	470 320	● 04d05 ^h 58 ^m	X2.1/3B	S14W34	8100
19971106-310	13 ^h	07d02 ^h	430	3.5	2900	● 06d11 ^h 55 ^m	2B/X9.4	S18W63	8100
19971113-317	23 ^h	14d04 ^h	1.3	1.7	170	◻ <13d22h26m	CME	b/s, W _L	8100, W _L -5d
19980420-110	11 ^h	21d06 ^h 21d12 ^h	860 1.6·10 ³	3.3 2.4	440 600	■ 20d10 ^h 21 ^m	M1.4/EPL	s20w90	8194, W _L -2d
19980430-120	02 ^h	30d15 ^h 01d15 ^h	1.3 1.2	2.9 2.6	65 75	● 29d16 ^h 37 ^m	M6.8/3B	S16E22	8210
19980502-122	14 ^h	02d16 ^h	130	1.8	800	● 02d13 ^h 42 ^m	X1.1/3B	S15W15	8210
19980506-126	08 ^h	06d09 ^h	120	2.6	575	● 06d08 ^h 09 ^m	X2.7/1N	S15W64	8210
19980509-129	06 ^h	09d13 ^h 09d23 ^h	4.7 8.9	2.3 2.3	230 230	■ 09d03 ^h 40 ^m	M7.7/ -	s15w90	8210, W _L -1d
19980616-167	21 ^h	17d09 ^h 18d02 ^h	1.3 1.4	2.4 2.2	80 75	■ 16d18 ^h 42 ^m	M1.0/ -	s22w90	8232, W _L -1d
19980822-234	06 ^h	23d00 ^h 23d08 ^h	1.7 1.5	1.8 1.8	80 85	● 22d00 ^h 09 ^m	M9.0/2B	N42E51	8307

Particles enhancements						Solar flares or CME – the particle sources			
Event name	T _o	T _{max}	J _{max} (pfu)	γ	Eqm, MeV	T _{Fl max} /T _{0 CME} */ T _{0 SC} , (UT)	Class of flare	Localizat ion	Active region
19980824-236	23 ^h	25d02 ^h 26d07 ^h	96 320	1.7 3.4	720 310	● 24d22 ^h 12 ^m	3B/X1.0	N35E09	8307
19980923-266	13 ^h	25d01 ^h	22	3.3	75	● 23d07 ^h 13 ^m	M7.1/3B	N19E09	8340
19980930-273	14 ^h	30d23 ^h	785	2.3	600	● 30d13 ^h 50 ^m	M2.8/2N	N23W78	8340
19981018-291	22 ^h	19d02 ^h 19d06 ^h	1.8 2.3	2.2 2.8	140 80	○ 15d<10 ^h 05 ^m ○ 18d01 ^h 45 ^m	DSF/27° M2.4/2B	N19E10 N16W53	8358
19981106-310	03 ^h	06d12 ^h	4.6	3.0	75	● 05d19 ^h 55 ^m	M8.4/2B	N22W18	8375
19981107-311	12 ^h	07d14 ^h 08d02 ^h	2.8 6	2.4 2.1	75 80	● 07d11 ^h 06 ^m ▲ SC 08d04 ^h 51 ^m	M2.4/SN	N14W43	8375
19981114-318	06 ^h	14d12 ^h 15d06 ^h	250 10	2.4 2.9	580 190	◻ 14d05 ^h 08 ^m	C1.3/BSL	n28w90	8375, W _L -2d
19981122-326	07 ^h	22d09 ^h 22d14 ^h	1.1 0.6	1.5 1.6	285 160	● 22d06 ^h 42 ^m	X3.7/1N	S27W82	8384
19981124-328	03 ^h	24d10 ^h	1.25	1.6	210	● 24d02 ^h 20 ^m	X1.0/SF	S30W81	8384
19990120-020	23 ^h	21d11 ^h 22d06 ^h	1.3 1.0	1.7 1.8	270 250	◻ 20d20 ^h 04 ^m	M5.2/...	n27e90	unknown, E _L
19990122-022	02 ^h	22d16 ^h 22d14 ^h	3 5	1.7 3.1	85 85	unknown Ø 22d17 ^h 24 ^m	M1.4/SF	N19W44	unknown 8440
19990424-114	15 ^h	24d21 ^h 25d06 ^h	3.7 4.3	2.2 2.3	85 210	◻ 24d<13 ^h 31 ^m	CME	b/s, W _L	8517, W _L -3d
19990504-124	08 ^h	05d21 ^h 06d06 ^h	3.7 4.0	2.8 3.2	75 65	⊙ 03d06 ^h 02 ^m	M4.4/2N	N15E32	8525
19990509-129	19 ^h	09d21 ^h	1.2	1.5	75	■ 09d18 ^h 07 ^m	M7.6/ ...	n23w90	8526, W _L -1d
19990527-147	12 ^h	27d13 ^h	2.75	1.6	275	◻ < 27d11 ^h 06 ^m ○ 26d19 ^h 32 ^m	CME M1.2/2N	b/s, W _L N17E46	unknown 8552
19990601-152	20 ^h	02d09 ^h 02d21 ^h	23 13	1.9 2.3	350 240	◻ 01d19 ^h 04 ^m	C1.2/...	n25w90	unknown
19990604-155	08 ^h	04d12 ^h	20	2.3	300	● 04d07 ^h 03 ^m	M3.9/2N	N18W72	8552
19990611-162	01 ^h	11d03 ^h	2.2	1.7	240	◻ 11d01 ^h 10 ^m	C1.0/...	b/s W event	unknown
19990625-176	10 ^h	26d12 ^h	1.7	3.5	40	Ø 26d05 ^h 12 ^m	M2.3/2B	N24E02	8598
19991117-321	19 ^h	19d02 ^h 19d23 ^h	1 0.4	2.55 3.1	50 25	● 17d09 ^h 57 ^m	M7.4/2B	N17E21	8766
20000218-049	06 ^h	18d12 ^h	1.7	2.0	290	⊙ 17d20 ^h 45 ^m	M1.3/2N	S29E07	8872
20000404-095	17 ^h	05d02 ^h 06d06 ^h	25 4	3.1 2.9	105 75	● 04d15 ^h 41 ^m	C9.7/2F	N16W66	8933
20000607-159	00 ^h	08d10 ^h	54	3.3	100	● 06d15 ^h 25 ^m	X2.3/3B	N20E18	9026
20000610-162	17 ^h	10d20 ^h	24	2.2	390	● 10d17 ^h 02 ^m	M5.2/3B	N22W39	9026
20000617-169	07 ^h	18d06 ^h	1.7	2.1	110	● 17d02 ^h 37 ^m	M3.5/2B	N22W72	9033
20000625-177	10 ^h	26d07 ^h	1.5	2.6	70	⊙ 25d07 ^h 52 ^m	M1.9/2N	N16W55	9046
20000713-195	06 ^h	13d10 ^h	5	3.1	40	⊙ 12d18 ^h 47 ^m	M5.7/2F	N16W64	9070
20000714-196	10 ^h	14d18 ^h 15d13 ^h	7.2 10 ³ 1.8 10 ⁴	3.7 4.7	2160 630	● 14d10 ^h 24 ^m SC 15d14 ^h 37 ^m	X5.7/3B	N22W07	9077
20000716-198	11 ^h	16d12 ^h 17d02 ^h	100 37	2.5 2.3	370 320	⊙ 15d08 ^h 33 ^m Ø 16d23 ^h 37 ^m	M1.3/SF M1.4/2F	N16W12 N17W40	9077
20000722-204	12 ^h	22d14 ^h 22d20 ^h	13 6	1.8 2.6	340 80	● 22d11 ^h 34 ^m	M3.7/2N	N14W56	9085
20000728-210	02 ^h	28d06 ^h 28d12 ^h	5 13	2.1 2.8	140 105	⊙ 27d23 ^h 42 ^m	M1.2/SF	N11W78	9090

Particles enhancements						Solar flares or CME – the particle sources			
Event name	T _o	T _{max}	J _{max} (pfu)	γ	Eqm, MeV	T _{Fl max} /T _{0 CME} */ T _{0 SC} , (UT)	Class of flare	Localizat ion	Active region
20000811-224	15 ^h	11d17 ^h	3.2	3.3	75	□ <11d16 ^h 54 ^m	CME	b/s, E _L	unknown
20000813-226	01 ^h	13d06 ^h	1.2	3.35	70	● 12d09 ^h 56 ^m	M1.1/SN	S16W79	9119
20000912-256	14 ^h	13d02 ^h	180	2,6	350	● 12d12 ^h 00 ^m	2F/M1.0	S19W08	9163
20001016-290	08 ^h	16d11 ^h 16d17 ^h	3.5 9.8	1.7 2.6	310 140	□ 16d07 ^h 28 ^m	M2.5/-	n05w90	9182
20001025-299	13 ^h	25d23 ^h	4.1	2.2	95	▣ 25d11 ^h 25 ^m	C4/...	... W90	unknown
20001031-305	07 ^h	01d03 ^h	2.1	2.3	70	○ 31d03 ^h 00 ^m	C6.0/1N	S20E80	9209
20001108-313	23 ^h	09d15 ^h	9.7 · 10 ³	3.7	650	● 08d23 ^h 28 ^m	3F/M7.4	N20W66	9213
20001124-329	07 ^h	24d21 ^h	65	1.7	460	● 24d05 ^h 02 ^m	X2.0/3B	N20W05	9236
20001126-331	03 ^h	26d20 ^h	670	2.9	400	● 25d01 ^h 31 ^m	M8.2/2N	N07E50	9240
20010128-028	18 ^h	29d01 ^h	29	2.1	325	● 28d16 ^h 40 ^m	1N/M1.5	S04W59	9313
20010226-057	09 ^h	26d20 ^h	1	2.4	65	▣ 26d07 ^h 41 ^m	C1.6/...	s04w90	9354
20010326-085	20 ^h	27d08 ^h	1.8	3.0	55	⊙ 26d13 ^h 26 ^m	M2.2/1F	N15E27	9393
20010329-088	13 ^h	29d19 ^h 31d00 ^h	7 22	2.3 3.1	215 115	● 29d10 ^h 15 ^m	1N/X1.7	N16W12	9393
20010402-092	23 ^h	03d07 ^h	112	2.9	575	■ 02d21 ^h 51 ^m	X>17.5/	n19w90	9393
20010409-099	17 ^h	09d20 ^h	2.2	1.2	390	● 09d15 ^h 34 ^m	M7.9/1B	S21W04	9415
20010410-100	08 ^h	11d01 ^h 11d20 ^h	50 280	2.2 2.8	350 260	● 10d05 ^h 26 ^m ∅ 11d13 ^h 26 ^m	3N/X2.3 M2.3/1F	S23W09 S20W28	9415
20010412-102	12 ^h	12d17 ^h 13d10 ^h	4.3 8.7	1.45 1.5	410 275	● 12d10 ^h 28 ^m	X2.0/2B	S20W42	9415
20010415-105	14 ^h	15d16 ^h	270	4.2	3480	● 15d13 ^h 50 ^m	X14.4/2B	S20W84	9415
20010418-108	03 ^h	18d10 ^h	190	2.8	2100	▣ 18d02 ^h 14 ^m	C2.2	s20w90	9415
20010427-117	03 ^h	28d05 ^h	15	3.6	80	● 26d13 ^h 20 ^m	M7.8/2B	N17W31	9433
20010507-127	14 ^h	07d18 ^h 08d12 ^h	7.7 11.5	2.3 3.15	80 85	▣ <07d12 ^h 06 ^m	CME	b/s, W _L	9433, 5d-W _L
20010520-140	07 ^h	20d10 ^h	1.8	1.75	410	● 20d06 ^h 03 ^m	M6.4/	s18w90	9455
20010615-166	16 ^h	15d20 ^h 16d06 ^h	5 8.1	2.1 2.7	335 120	▣ <15d15 ^h 56 ^m	CME	b/s, W _L	unknown
20010809-221	20 ^h	09d11 ^h	6	3.3	85	⊙ 09d11 ^h 22 ^m	C3.7/SF	N10E54	DSF
20010816-228	00 ^h	16d03 ^h 17d12 ^h	87 75	3.0 2.1	600 475	▣ <15d23 ^h 54 ^m	CME	b/s, W _L -	9557?,5d-W _L
20010915-258	12 ^h	15d15 ^h	6	2.4	150	● 15d11 ^h 28 ^m	1N/M1.5	S21W49	9608
20010924-267	11 ^h	24d18 ^h 25d07 ^h 25d22 ^h	390 1.1 · 10 ³ 9.5 · 10 ³	3.8 2.5 3.2	470 580 580	● 24d10 ^h 38 ^m ∅ 25d04 ^h 24 ^m SC 25d20 ^h 25 ^m	X2.6/2B M7.6/1N	S17E26 S18W01	9632 9628
20011001-274	14 ^h	01d23 ^h 02d07 ^h	370 1.3 · 10 ³	4.8 5.6	155 150	■ 01d05 ^h 15 ^m	M9.1/...	s18w80	9628
20011019-292	02 ^h	19d08 ^h 19d21 ^h	3.6 8	1.75 1.9	300 310	● 19d01 ^h 05 ^m ∅ 19d16 ^h 13 ^m	X1.6/2B X1.6/2B	N16W18 N15W30	9691
20011022-295	16 ^h	22d21 ^h	17	1.5	425	● 22d17 ^h 59 ^m	X1.2/2B	S18E16	9672
20011028-301	02 ^h	28d07 ^h	1.1	2.6	60	○ 28d04 ^h 50 ^m	M1.3/1F	N12E40	9682
20011104-308	16 ^h	04d20 ^h 06d00 ^h	540 2.4 · 10 ⁴	3.2 4.5	750 685	∅ 04d06 ^h 43 ^m ● 04d16 ^h 20 ^m	C8.4/1N X1.0/3B	N14W57 N07W19	9682 9684
20011117-321	10 ^h	19d22 ^h	13	4.6	45	● 17d05 ^h 25 ^m	M2.8/2N	S13E42	9704
20011122-326	21 ^h	23d10 ^h 24d06 ^h	2.7 · 10 ³ 1.1 · 10 ⁴	4.2 4.5	390 350	∅ 22d20 ^h 36 ^m ● 22d<23 ^h 30 ^m	M3.8/2B M9.9/3B	S26W68 S13W38	9698 9704

Particles enhancements						Solar flares or CME – the particle sources			
Event name	T _o	T _{max}	J _{max} (pfu)	γ	Eqm, MeV	T _{Fl max} /T _{0 CME} */ T _{0 SC} , (UT)	Class of flare	Localizat ion	Active region
20011226-360	05 ^h	26d11 ^h	336	2,55	800	● 26d05 ^h 40 ^m	M7.1/1B	N08W54	9742
20011229-363	05 ^h	29d08 ^h	40	2,7	195	■ 28d20 ^h 45 ^m	X3.4/ -	s26e90	9767
20011230-364	20 ^h	31d02 ^h 31d16 ^h	25.5 75	2.6 3.1	190 170	□ 29d21 ^h 27 ^m	M1.8/	s08w90	9748
20020110-010	02 ^h	11d01 ^h	70	3.0	85	⊙ 09d18 ^h 01 ^m	M9.5/2B	N13W02	9773
20020115-015	07 ^h	15d18 ^h	7.5	2.15	80	□ 14d06 ^h 27 ^m	M4.4/...	s23w90	9767,1.5d-W _L
20020220-051	07 ^h	20d08 ^h	3.3	2.5	145	● 20d06 ^h 12 ^m	M5.1/1N	N12W72	9825
20020316-075	02 ^h	16d13 ^h 17d11 ^h	1.3 1.1	2.7 2.4	70 65	● 15d23h10m	M2.2/1F	S08W03	9866
20020318-077	00 ^h	18d15 ^h 19d06 ^h	14.5 20	2.65 2.6	155 145	⊙ 17d19 ^h 31 ^m ∅ 18d02 ^h 31 ^m	M4.0/SF M1.0/SN	S22E16 S16E27	9871
20020320-079	13 ^h	20d17 ^h	8	3.6	60	○ 20d08 ^h 33 ^m ▲ SC20d13 ^h 28 ^m	C1.9/SF	S19W41	9873
20020322-081	12 ^h	22d20 ^h 23d13 ^h	1 9	3.7 3.85	45 50	■ 22d11 ^h 14 ^m SC 23d11 ^h 37 ^m	M1.6/...	s10w90	9866
20020417-107	10 ^h	17d16 ^h	21	2.75	120	● 17d08h24m	M2.6/2N	S14W36	9906
20020419-109	05 ^h	19d09 ^h 19d19 ^h	1 2.7	3.5 3.4	45 50	SC 19d08 ^h 36 ^m ○ 19d15h21m	- C2.5/SF	- S16W59	9906
20020421-111	01 ^h	21d03 ^h 21d09 ^h	915 1.7·10 ³	1.9 2.8	575 570	■ 21d01 ^h 51 ^m	X1.5/1F	S14W84	9906
20020522-142	07 ^h	23d10 ^h 23d16 ^h	260 87	3.75 3	125 175	⊙ 22d03 ^h 54 ^m	C5.0/SF	S22W53	DSF
20020707-188	13 ^h	07d20 ^h	26	2.8	85	■ 07d11 ^h 43 ^m	M1/...	s19w90	10017
20020716-197	12 ^h	16d22 ^h 17d14 ^h	27 85	3.5 3.4	125 135	● 15d20 ^h 08 ^m ∅ 17d07 ^h 13 ^m	3B/X3.0 M8.5/1B	N19W01 N20W16	10030
20020719-200	05 ^h	19d11 ^h	3.6	2.15	215	□ 18 ^d 07 ^h 44 ^m	X1.8/2B	N19W33	10030
20020722-203	01 ^h	22d11 ^h	18.5	2.6	85	□ 20d21 ^h 30 ^m	X3.3/...	s13e90	10039
20020814-226	06 ^h	14d09 ^h 14d16 ^h	6.7 6.9	2.5 4	85 50	● 14d02 ^h 12 ^m	M2.3/1N	N10W54	10061
20020817-229	00 ^h	17d10 ^h	1.7	2.6	70	● 16d12 ^h 32 ^m	2N/M5.2	S14E20	10069
20020818-230	22 ^h	19d03 ^h 19d12 ^h	2.3 1.8	2.1 2.25	75 70	● 18d21 ^h 25 ^m	1N/M2.2	S10W20	10069
20020820-232	09 ^h	20d10 ^h	2.5	1.95	80	● 20d01 ^h 40 ^m	M5.0/1B	S10W35	10069
20020822-234	03 ^h	22d05 ^h	16	1.5	450	● 22d01 ^h 57 ^m	M5.4/2B	S07W62	10069
20020824-236	01 ^h	24d03 ^h	92	2.1	775	● 24d01 ^h 12 ^m	X3.1/1F	S02W81	10069
20020906-249	06 ^h	06d14 ^h 07d17 ^h	3 67	2.2 3.15	80 175	⊙ 05d17 ^h 06 ^m SC 07d16 ^h 38 ^m	C5.2/SF	N12E28	10102
20021109-313	17 ^h	10d02 ^h 10d13 ^h	150 40	3.5 3.1	160 145	● 09d13 ^h 23 ^m ∅ 10d03 ^h 21 ^m	M4.6/2B M2.4/2N	S04W29 S12W37	10180
20030528-148	04 ^h	28d11 ^h 29d16 ^h	2 77	2.0 2.95	170 175	● 27d23 ^h 07 ^m ∅ 29d01 ^h 05 ^m	X1.3/2B X1.3/2B	S06W20 S06W37	10365
20030531-151	03 ^h	31d06 ^h	15.6	1.5	415	● 31d02 ^h 24 ^m	M9.3/2B	S07W65	10365
20030618-169	08 ^h	20d06 ^h	10.2	2.7	180	⊙ 17d22 ^h 55 ^m	M6.8/...	s12e60	10368
20031026-299*	18 ^h	26d20 ^h 27d02 ^h	230 360	3.1 2.9	340 400	● 26d18 ^h 19 ^m	X1.2/1N	N02W38	10484

Particles enhancements						Solar flares or CME – the particle sources			
Event name	T _o	T _{max}	J _{max} (pfu)	γ	Eqm, MeV	T _{Fl max} /T _{0 CME} / T _{0 SC} , (UT)	Class of flare	Localizat ion	Active region
20031028-301	12 ^h	28d18 ^h 29d02 ^h	4.6·10 ³ 1.2·10 ⁴	2.9 3.9	3340 1025	● 28d11 ^h 10 ^m	X17.2/4B	S16E08	10486
20031029-302	22 ^h	29d23 ^h	2.2·10 ³	2.0	810	● 29d20 ^h 49 ^m	X10.0/2B	S15W02	10486
20031102-306	17 ^h	02d23 ^h	990	3.1	1700	● 02d17 ^h 25 ^m	X8.3/2B	S14W56	10486
20031104-308	22 ^h	05d07 ^h	126	2.7	445	● 04d19 ^h 50 ^m	X>17.5/3B	S19W83	10486
20031120-324	08 ^h	20d11 ^h	4.4	2.2	140	● 20d07 ^h 47 ^m SC 20d08 ^h 03 ^m	M9.6/2B	N01W08	10501
20031121-325	08 ^h	22d02 ^h	10.7	2.5	80	● 20d23 ^h 53 ^m	M5.8/2B	N02W17	10501
20031202-336	12 ^h	02d18 ^h	21	4.0	100	☉ 02d09 ^h 47 ^m	C7.2/...	s19w90	10508
20040411-102	06 ^h	11d12 ^h 11d20 ^h	13 14.5	3.0 3.0	95 80	● 11d04 ^h 19 ^m Ø <11d11 ^h 54 ^m	C9.6/1F CME	S14W47 b/s, W _L	10588 unknown
20040722-204	17 ^h	22d20 ^h 23d10 ^h	0.9 2	2.0 2.0	70 155	☉ 22d00 ^h 32 ^m	M9.1/SB	n06e25	10652
20040723-205	16 ^h	23d19 ^h	1.8	2.25	75	☉ 22d22 ^h 58 ^m	2N/M1.6	N05E04	10652
20040725-207	17 ^h	25d21 ^h 26d23 ^h	27 430	2.8 3.8	140 155	● 25d15 ^h 14 SC26d22 ^h 49 ^m	M1.1/1F	N08W33	10652
20040801-214	01 ^h	01d21 ^h 02d02 ^h	5.2 4.8	2.25 2.3	80 75	☐ 31d05 ^h 16 ^m Ø 31d10 ^h 35 ^m	C8.4/... C5.3/	n02w90 n02w90	10652>1,5d W _L
20040913-257	19 ^h	13d23 ^h 14d05 ^h	210 180	3.4 4.1	110 90	☉ 12d00 ^h 56 ^m Ø 12d01 ^h 39	M4.8/2N M3.2/SN	N04E42 S14W61	10672 10667
2004.09.19-263	18 ^h	20d01 ^h 21d02 ^h	46 10	2.2 2.2	390 100	● 19d17 ^h 12 ^m	M1.9/...	n03w60	10672
20041101-306	06 ^h	01d08 ^h	54	1.9	410	● 01d03 ^h 22 ^m	M1.1/1F	N15W41	10691
20041107-312	01 ^h	07d23 ^h 09d00 ^h	490 70	3.0 3.2	330 100	● 07d15 ^h 42 ^m Ø 08d15 ^h 49 ^m	X2.0/... M2.3/1N	n10w15 N08W35	10696
20041110-315	02 ^h	10d10 ^h 10d16 ^h 12d09 ^h	264 193 75	2.2 2.5 3.0	485 430 110	● 09d17 ^h 19 ^m Ø 10d02 ^h 13 ^m	M8.9/2N X2.5/3B	N07W51 N09W49	10969
20050115-015	07 ^h	15d11 ^h	7.4	1.7	300	● 15d06 ^h 38 ^m	M8.6/SF	N11E06	10720
20050116-016	00 ^h	16d18 ^h	330	2.9	330	● 15d23h02m	X2.6/3B	N14W08	10720
20050117-017	13 ^h	17d17 ^h	3.8·10 ³	2.8	750	● 17d09 ^h 52 ^m	X3.8/3N	N14W24	10720
20050120-020	06 ^h	20d10 ^h 21d17 ^h	1.1·10 ³ 134	3.9 2.2	3840 1520	● 20d07 ^h 01 ^m SC 21d17 ^h 11 ^m	X7.1/2B	N12W58	10720
20050513-133	19 ^h	14d03 ^h 14d14 ^h 15d03 ^h	7.7 155 1.9·10 ³	1.85 3.3 4.4	300 85 85	● 13d16 ^h 57 ^m SC 15d 02 ^h 38 ^m	M8/2B	N12E12	10759
20050616-167	20 ^h	17d04 ^h	41	1.8	510	■ 16d20 ^h 22 ^m	M4.0/SF	N09W87	10775
20050710-191	03 ^h	10d05 ^h 10d12 ^h	1.1 1.9	1.85 2.8	75 70	● 09d22 ^h 06 ^m	M2.8/1N	N11W27	10786
20050713-194	17 ^h	15d04 ^h	9.7	2.6	115	● 13d14 ^h 49 ^m	M5/SF	N10W80	10786
20050714-195	14 ^h	15d03 ^h	130	3.15	185	■ 14d10 ^h 55 ^m	X1.2/...	n11w90	10786
20050717-198	14 ^h	17d18 ^h 17d22 ^h	12 19	2.25 3.9	85 85	☐ 17d10 ^h 32 ^m	B1.1/...	n13w9	10786, 3d-W _L
20050725-206	21 ^h	28d14 ^h 29d14 ^h	30 36	2.8 2.8	85 85	☐ 27d04 ^h 33 ^m Ø28d22 ^h 08 ^m	M3.7/... M4.8/SF	n10e90 N08E84	10792, E _L 10792
20050731-212	22 ^h	01d05 ^h 02d01 ^h	21 6	4.1 3.3	65 65	☉ 30d 06 ^h 35 ^m Ø 01d13 ^h 51 ^m	X1.3/2B M1.0/1F	N12E61 N14E29	10792
20050822-234	03 ^h	22d07 ^h	5.4	2.4	80	● 22d01 ^h 33 ^m	M2.6/1F	S09W48	10798

Particles enhancements						Solar flares or CME – the particle sources			
Event name	T _o	T _{max}	J _{max} (pfu)	γ	Eqm, MeV	T _{Fl max} /T _{0 CME} */ T _{0 SC} , (UT)	Class of flare	Localizat ion	Active region
20050822a-234	19 ^h	23d02 ^h 23d10 ^h	280 290	3.1 3.0	330 290	● 22d16 ^h 52 ^m	M5.6/1N	S12W60	10798
20050907-250	21 ^h	08d20 ^h 10d11 ^h	70 1000	2.3 3.0	800 555	● 07d17 ^h 40 ^m Ø09d20 ^h 04 ^m	X17.0/3B X6.2/2B	S06E89 S12E67	10808
20050914-257	00 ^h	14d15 ^h 15d08 ^h	160 180	3.5 3.75	85 85	● 13d19 ^h 27 ^m SC 08 ^h 35 ^m	X1.5/2B	S09E10	10808
20061205-339	15 ^h	05d20 ^h	2.5	1.8	275	● 05d10 ^h 35 ^m	X9/2N	S07E79	10930
20061206-340	10 ^h	7d22 ^h	1.9·10 ³	2.6	850	● 06d18 ^h 47 ^m	X6.5/3B	S06E63	10930
20061213-347	03 ^h	13d09 ^h	660	4.7	3440	● 13d02 ^h 40 ^m	X3.4/4B	S06W24	10930
20061214-348	23 ^h	15d00 ^h	160	2.5	≥500	● 14d22 ^h 15 ^m	X1.5/2B	S06W46	10930

- *) **T_{Fl max}** – time of peak intensity for a flare (UT);
T_{0 CME} – time of liftoff of CME in sight of coronagraph;
T_{0 SC} – time of SC arrival to the Earth.