

Multi-energy analysis of SOHO/ERNE proton events *[On-line catalog]*

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Catalogs of Solar Energetic Particles and Related Phenomena

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[Wind/EPACT proton event catalog](#)

[SOHO/ERNE proton event catalog](#)

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SOHO/ERNE proton event catalog

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[Solar cycle 23: 1996-2008](#)

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[Solar cycle 24: 2009-present](#)

This catalog lists the proton enhancements from the **High Energy Detector (HED)** aboard [SOHO/ERNE](#) instrument identified during solar cycle (SC) 23 (1996-2008) and the ongoing solar cycle 24 (since 2009). The catalog lists the peak intensity for the solar proton events in the different HED energy channels (in the range 17÷131 MeV) and additional information organized in table-form separately for SC23 and SC24.

Explanatory notes:

Proton peak: identified at the maximum of the particle profile (local enhancements are not considered).

Onset time: identified as the time of 3-sigma intensity value above pre-event level.

Peak time: identified at the maximum of the particle profile (local enhancements are not considered).

J_p : peak proton intensity after subtraction of the pre-event level in protons/(cm² s sr MeV).

class: GOES soft X-ray flare class

speed: linear speed of the CME in km s⁻¹

time: all time markers are in UT

The reported here onset/peak times and J_p are based on 5-min averaged data.

Abbreviations:

AW: angular width of the CME (in degrees)

CME: coronal mass ejection

N/A: onset not found and/or it was fully masked by previous ongoing event

nd: next day

pd: previous day

p: peak is poorly defined

u: uncertain

Acknowledgements:

We use proton data provided by SOHO/ERNE PI Prof. Eino Valtonen

(ERNE data is also available via: [SEPServer data server](#));

flare information from: [GOES flare listings](#) and [www.Solarmonitor.org](#);

and CME information from: [CDAW LASCO CME catalog](#).

Contact: [R. Miteva](#)

Links: [Space Climate Group Homepage](#)

[Space Research and Technology Institute Homepage](#)

SOHO/ERNE proton event catalog is part of **SEP origin project**

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SOHO/ERNE proton event catalog

Solar cycle 23: 1996-2008

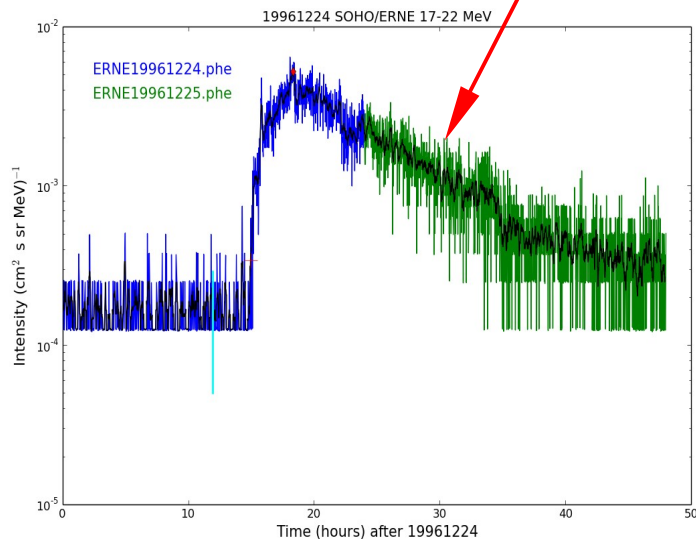
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[Solar cycle 24: 2009-present](#)

Event date yyyy-mm-dd	14-17 MeV	17-22 MeV			21-28 MeV	26-32 MeV	32-40 MeV	40-51 MeV	51-67 MeV	64-80 MeV	80-101 MeV	101-131 MeV	Flare	
	J_p	onset time	peak time	J_p	J_p	J_p	J_p	J_p	J_p	J_p	J_p	J_p	class/onset/location	time
1996-07-09		10:03	10:50	0.0016		0.0004		-		-		-	X2.6/09:05/S10W30	
1996-08-13		17:53	22:05	0.0038		0.0012		0.0005		-		-	uncertain	16:
1996-11-27		00:18	02:37	0.0004		-		-		-		-	B9.0/20:48 ^{pd} /u	21:
1996-11-27		14:22	15:20	0.0005		-		-		-		-	uncertain	
1996-11-28		19:53	22:09	0.0034		0.0007		-		-		-	C1.3/15:35/u	16:
1996-11-29		04:43	13:49	0.0015		0.0003		-		-		-	uncertain	
1996-11-30		06:23	07:14	0.0101		0.0022		0.0002		-		-	uncertain	
1996-12-01		22:05	01:33 nd	0.0005		-		-		-		-	M1.0/20:16/S06W47	
1996-12-24		14:59	18:21	0.0050		0.0014		0.0003		-		-	C2.1/13:03/N05W95	13:
1997														
1998														



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**Flare and CME
information**

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[Solar cycle 23: 1996-2008](#)

Event date	14-17 MeV	17-22 MeV			21-28 MeV	26-32 MeV	32-40 MeV	40-51 MeV	51-67 MeV	64-80 MeV	80-101 MeV	101-131 MeV	Flare	
	J _p	onset time	peak time	J _p	J _p	J _p	J _p	J _p	J _p	J _p	J _p	J _p		
2009-12-22		07:33	13:18	0.0011		0.0004		0.00022		-		-	C7.2/04:50/S26W46	
2010-02-12		17:20	22:19	0.0007		0.0003		-		-		-	M8.3/11:19/N23E11	
2010-04-04		10:23	11:06	0.0002		-		-		-		-	uncertain	
2010-06-12		02:32	07:02	0.0207		0.0061		0.0023		-		-	M2.0/00:30/N43W23	01:30
2010-08-03		N/A	23:06 ^u	0.0326		0.0025		-		-		-	uncertain	
2010-08-07		20:09	01:33 nd	0.0042		0.0042		0.0011		-		-	M1.0/17:55/N11E34	18:30
2010-08-14		10:53	12:48	0.6267		0.1852		0.0512		-		-	C4.4/09:38/N17W52	10:30
2010-08-18		07:18	11:52	0.1170		0.0190		0.0037		-		-	C4.5/04:45/N18W88	05:45
2010-08-31		23:28	04:20 nd	0.0191		0.0046		0.0010		-		-	uncertain	21:30
2010-09-09		01:02	04:38	0.0135		0.0024		0.0006		-		-	C3.3/23:05/N21W87	23:30
2010-12-31		05:58	06:57	0.0004		-		-		-		-	C1.3/04:18/N12W57	05:30
2011														
2012														
2013														

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Future work:

- Completion of the remaining 5 energy channels.
- Catalog release: after acceptance of a dedicated publication.

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