The SEPEM Reference Data Set (RDS) – Version 2.0

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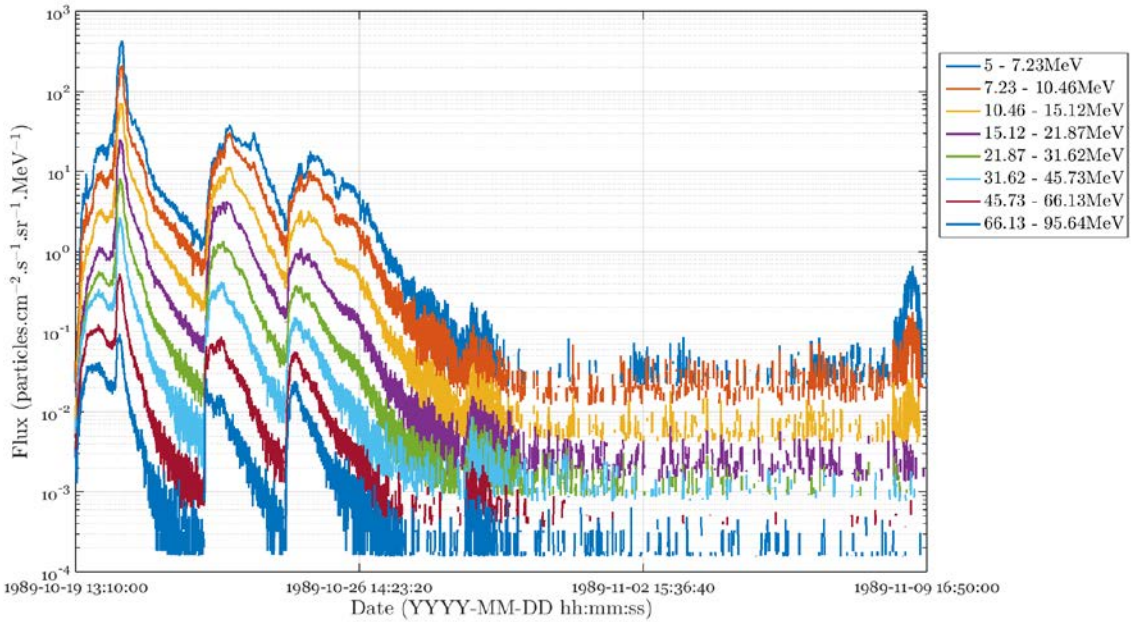
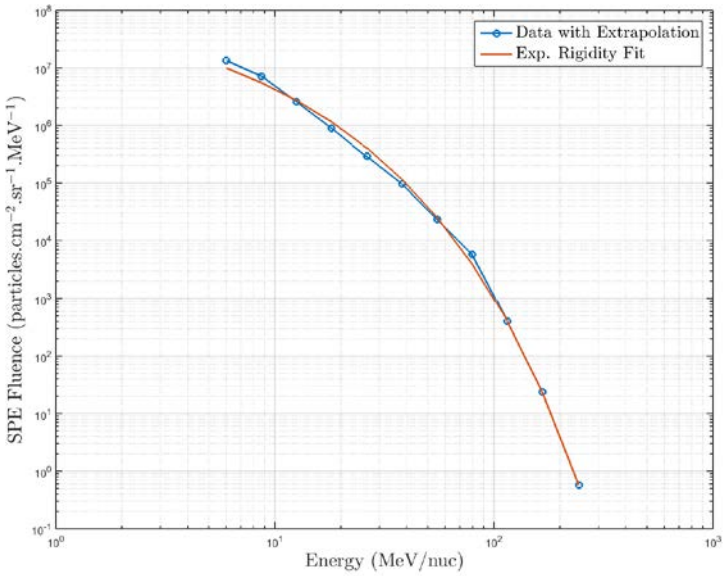




SEPEM Reference Data Set v2.0

Data has been processed from the NOAA Energetic Particles Sensor (EPS), part of the Space Environment Monitor (SEM) package on-board GOES and earlier SMS satellites.

These data have been cross-calibrated* to find the effective (mean) energy of each energy bin using data from the Goddard Medium Energy (GME) instrument on-board the IMP-8 spacecraft. Data available:

1. Cleaned data with reference energies provided for each channel & instrument

2. RDS interpolated to 11 reference channels (log-spaced from 5-300 MeV)

The time range for Version 2.00 of the data set is from 1974-07-01 until 2015-12-31. New data will be added on a regular basis.

ftp://ftp.estec.esa.int/private/pjiggens/anonymous/SEPEM_RDS_v2-00.zip

Citation: SEPEM Reference Data Set version 2.00, European Space Agency (2016).

***Sandberg, I., P. Jiggens, D. Heynderickx, and I. A. Daglis (2014), Cross calibration of NOAA GOES solar proton detectors using corrected NASA IMP-8/GME data, Geophys. Res. Lett., 41, doi:10.1002/2014GL060469.**

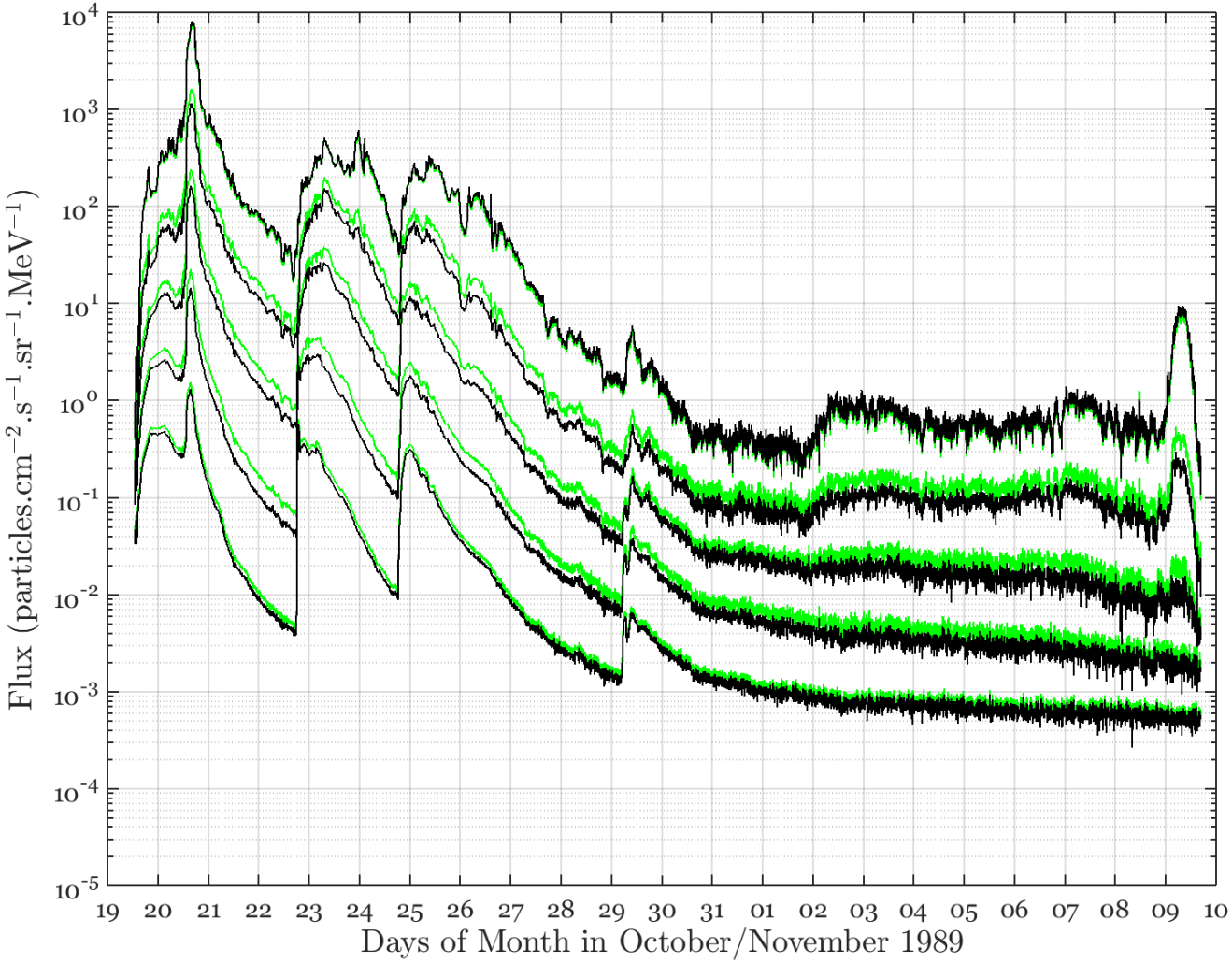
Usage of different Data in RDS v2.0

Spacecraft	SEM(-2) data available	Usage in RDS
SMS-01	1974-07-01 - 1975-10-31	1974-07-01 - 1975-01-31
SMS-02	1975-02-01 – 1978-03-31	1975-02-01 - 1977-03-31
GOES-01	1976-01-01 – 1978-05-31	1977-04-01 - 1977-07-31
GOES-02	1977-08-01 – 1983-05-31	1977-08-01 - 1983-05-19
GOES-03	1978-07-01 – 1979-12-31	(not used)
GOES-05	1984-01-01 – 1987-03-31	1983-05-20 - 1987-03-05
GOES-06	1983-05-01 – 1994-12-31	(not used*)
GOES-07	1987-03-01 – 1996-08-31	1987-03-06 - 1994-12-31
GOES-08	1995-01-01 – 2003-06-17	1995-01-01 - 2003-06-16
GOES-09	1997-01-01 – 1998-08-31	(not used)
GOES-10	1998-07-01 – 2009-12-31	(not used)
GOES-11	2000-07-01 – 2011-02-28	2003-06-17 - 2011-01-31
GOES-12	2003-01-01 – 2010-09-30	(not used)
GOES-13	2007-07-17 – 2015-12-31	2011-02-01 – 2015-05-31

***Used to fill 6 months of GOES-05 data but no SPEs occurrred**

Example: October 1989 RDS v2.0 (black) Comparison to (uncorrected) GOES data (green)

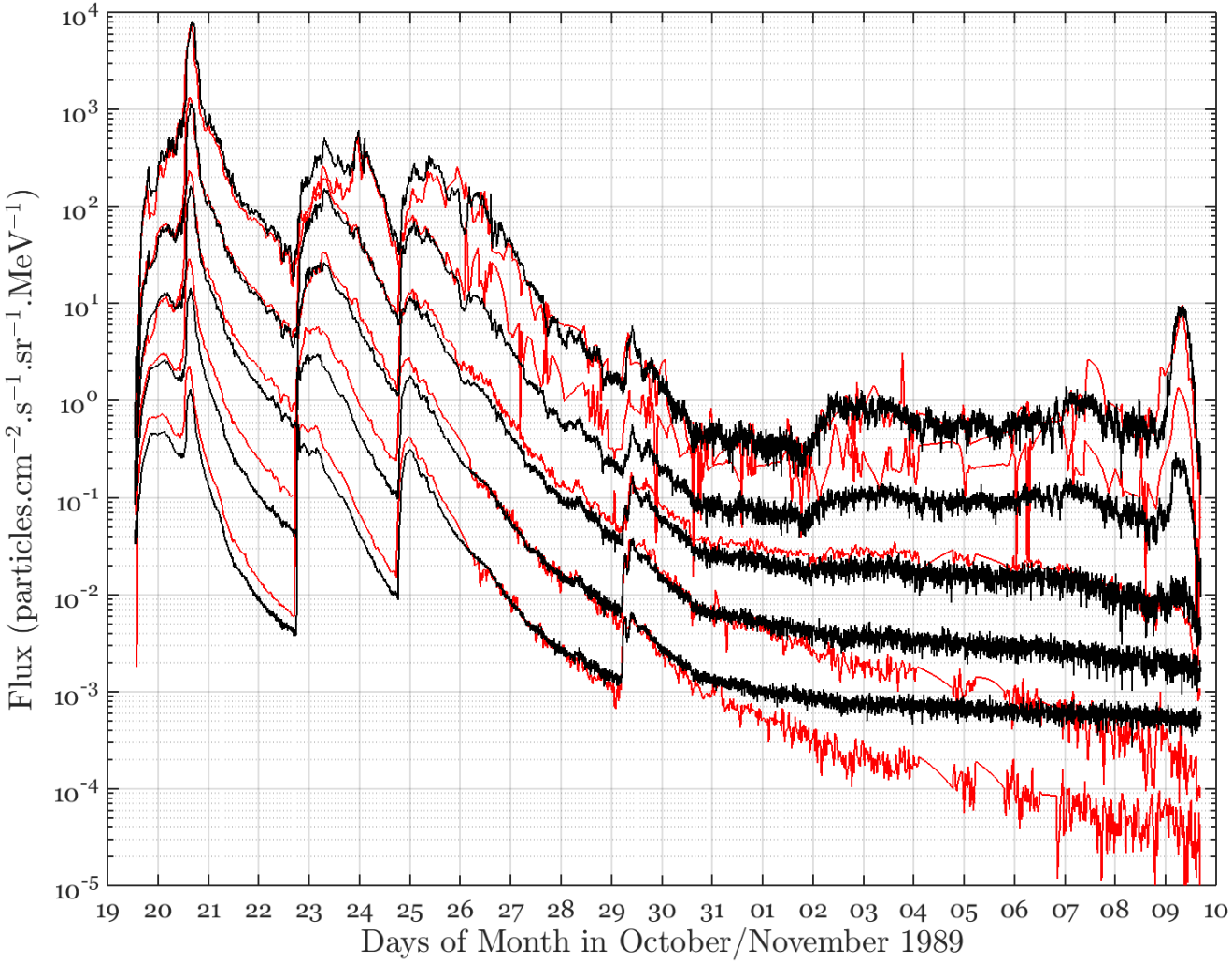
Proton Fluxes (N.B. RDS v2.0 also includes He)



Ch.	En. (MeV)
1	6.01
2	8.70
3	12.58
4	18.18
5	26.30
6	38.03
7	54.99
8	79.53
9	115.0
10	166.3
11	244.2

Example: October 1989 RDS v2.0 (black) Comparison to PSYCHIC data (red)

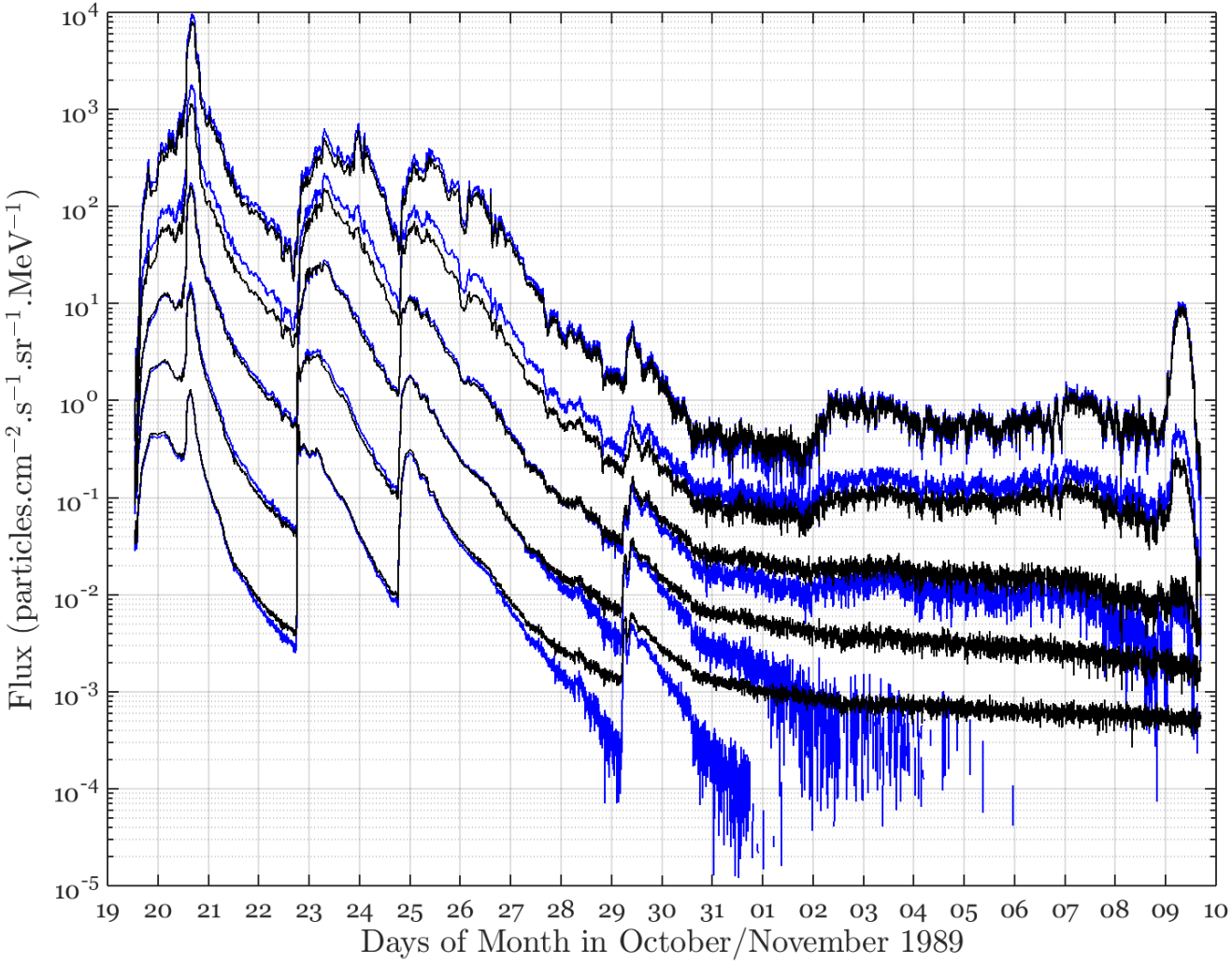
Proton Fluxes (N.B. RDS v2.0 also includes He)



Ch.	En. (MeV)
1	6.01
2	8.70
3	12.58
4	18.18
5	26.30
6	38.03
7	54.99
8	79.53
9	115.0
10	166.3
11	244.2

Example: October 1989 RDS v2.0 (black) Comparison to RDS v1.0 (blue)

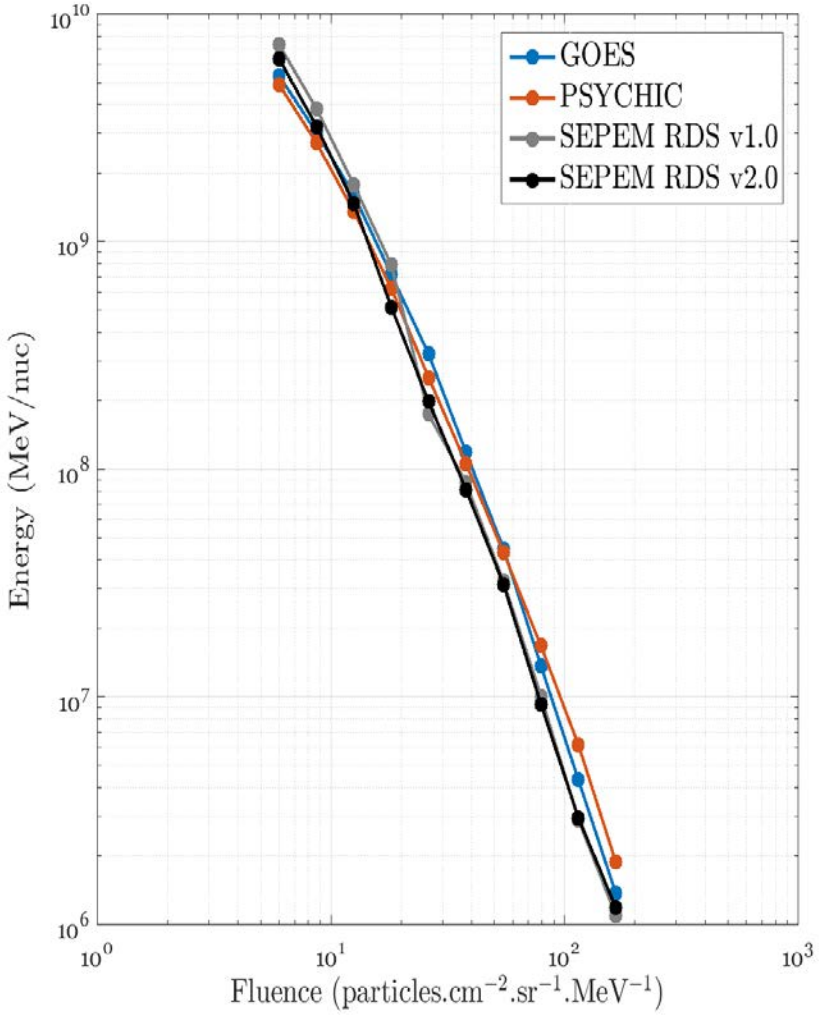
Proton Fluxes (N.B. RDS v2.0 also includes He)



Ch.	En. (MeV)
1	6.01
2	8.70
3	12.58
4	18.18
5	26.30
6	38.03
7	54.99
8	79.53
9	115.0
10	166.3
11	244.2

Fluence Comparison (#.cm^{-2}.sr^{-2}.MeV^{-1})

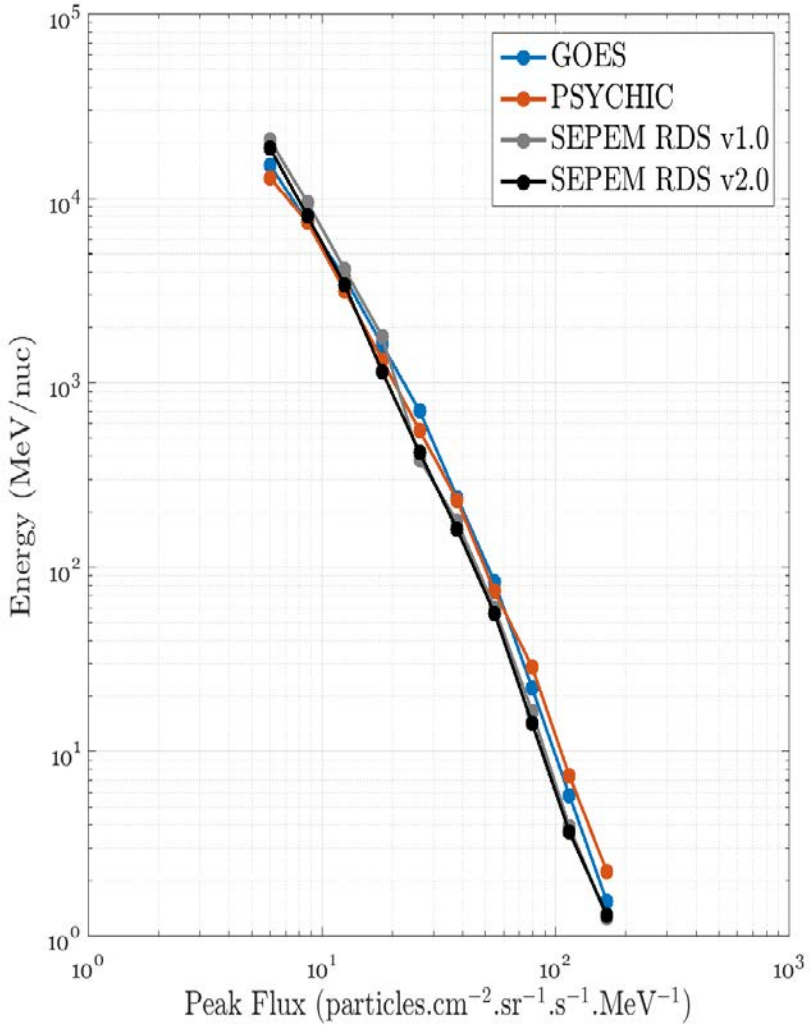
Proton Fluxes (N.B. RDS v2.0 also includes He)



Ch.	En. (MeV)	GOES	PSYCHIC		RDS v1.0		RDS v2.0	
1	6.01	5.38E+09	4.93E+09	-8.4	7.39E+09	37.5	6.41E+09	19.2
2	8.70	3.04E+09	2.73E+09	-10.0	3.86E+09	26.9	3.23E+09	6.2
3	12.58	1.61E+09	1.36E+09	-15.3	1.79E+09	10.8	1.48E+09	-8.3
4	18.18	7.20E+08	6.27E+08	-12.9	7.95E+08	10.4	5.18E+08	-28.0
5	26.30	3.22E+08	2.54E+08	-21.1	1.75E+08	-45.5	1.99E+08	-38.1
6	38.03	1.19E+08	1.06E+08	-10.6	8.74E+07	-26.4	8.16E+07	-31.3
7	54.99	4.49E+07	4.33E+07	-3.7	3.23E+07	-28.2	3.13E+07	-30.4
8	79.53	1.37E+07	1.68E+07	22.5	1.01E+07	-26.3	9.32E+06	-32.2
9	115.0	4.34E+06	6.18E+06	42.5	2.90E+06	-33.2	2.96E+06	-31.8
10	166.3	1.38E+06	1.89E+06	37.2	1.10E+06	-20.1	1.19E+06	-13.7

Peak Flux Comparison (#.cm^{-2}.sr^{-2}.s^{-1}.MeV^{-1})

Proton Fluxes (N.B. RDS v2.0 also includes He)



Ch.	En. (MeV)	GOES	PSYCHIC		RDS v1.0		RDS v2.0	
1	6.01	1.52E+04	1.30E+04	-14.5	2.08E+04	37.1	1.89E+04	24.1
2	8.70	7.52E+03	7.50E+03	-0.3	9.57E+03	27.3	8.08E+03	7.5
3	12.58	3.72E+03	3.17E+03	-14.7	4.13E+03	11.1	3.41E+03	-8.4
4	18.18	1.62E+03	1.33E+03	-17.5	1.79E+03	10.7	1.15E+03	-28.6
5	26.30	7.07E+02	5.53E+02	-21.7	3.86E+02	-45.3	4.20E+02	-40.6
6	38.03	2.41E+02	2.32E+02	-3.5	1.78E+02	-26.2	1.61E+02	-33.1
7	54.99	8.38E+01	7.45E+01	-11.1	6.06E+01	-27.8	5.64E+01	-32.7
8	79.53	2.23E+01	2.90E+01	29.9	1.66E+01	-25.6	1.43E+01	-35.8
9	115.0	5.83E+00	7.44E+00	27.7	3.95E+00	-32.3	3.68E+00	-36.9
10	166.3	1.55E+00	2.25E+00	45.7	1.26E+00	-18.6	1.31E+00	-15.3

Overview of zip archive and README

- Daniel Heynderickx (DH Consultancy)

That's it!

Download the proton and helium data:

ftp://ftp.estec.esa.int/private/pjiggens/anonymous/SEPEM_RDS_v2-00.zip

Make some comparisons.

Let me know if you want to make it available through another resource (we are very open to this)