Review of SOHO/CELIAS archive

Nina Dresing
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• SOHO/CELIAS
  • CTOF
  • DPU
  • HSTOF
  • MTOF
  • PM
  • SEM
  • STOF

CELIAS (Charge, Element, and Isotope Analysis System) measures the mass, ionic charge and energy of the solar wind, supra-thermal ions, and low energy energetic particles.

PI-ship now in Kiel, Germany (Bob Wimmer-Schweingruber)

Everything marked in red which (possibly) requires action
Celias detectors:
- CTOF (broke after 4 months)
- MTOF
  - PM (SOHO’s solar wind instrument)
- STOF
  - HSTOF (high en. portion of STOF)
- SEM (EUV flux)
- DPU (Digital Processing Unit)

- not clear which time resolution
- only one resolution available?
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Documentation missing!
A complete documentation (including the raw data) is probably not possible. PI team could compile a new doc (manpower: several months)
Or PI team could compile a short documentation for level1 data only.

Unclear name
CTOF: elemental charge and velocity distribution of the solar wind

- Level 1 Science data
  - O Densities (1 April 96 - 15 Aug 95)
  - Fe Densities (less files)
  - Heavy ion freeze in temperatures (sporadically, no nominal data product)

All data is in cdf format. These files are not owned by the current PI group.
• Level 1 Science data
  • O Densities (1 April 96 - 15 Aug 95)
  • Fe Densities
  • Heavy ion freeze in temperatures

• Level ASCII
  • Matrix rates
  • Rates
  • Housekeeping
  • Pulse Height Analyzer

• Data until May 2018 (dangerous?)
• Level 1 Science data
  • O Densities (1 April 96 - 15 Aug 95)
  • Fe Densities
  • Heavy ion freeze in temperatures
• Level ASCII
  • Matrix rates
  • Rates
  • Housekeeping
  • Pulse Height Analyzer
• Data until May 2018 (dangerous?)

New high level data (velocity spectra of heavy ions+n,T) could be provided by the PI group (at some point)
MTOF: elemental and isotropic composition of the solar wind

- Level 1 Science data:
  - Coronal Mass Ejection (?): 1 file only

There does not exist real Level 1 data due to ‘instrument problems’
MTOF: elemental and isotropic composition of the solar wind

• Level 1 Science data:
  • Coronal Mass Ejection (?): 1 file only
• Level ASCII (up to May’18)
  • Housekeeping
  • TOF Spectra 1
  • TOF Spectra 2
  • Pulse Height Analyzer
  • Rates
STOF: mass, charge, and energy distribution of supra thermal ions

• **Level 1 Science data:**
  • SEM data (wrongly listed!)
  1 Jan 1996-1 Dec 1999
STOF: mass, charge, and energy distribution of supra thermal ions

• Level 1 Science data:
  • SEM data (wrongly listed!)
  1 Jan 1996-1 Dec 1999

• Level ASCII (up to May’18)
  • STOF Low Basic Rates
  • STOF High Basic Rates
  • Matrix Elements
  • Matrix Rates
  • Pulse Height Analyzer
  • Diagnostic
SOHO/CELIAS/STOF

STOF: mass, charge, and energy distribution of supra thermal ions

• Level 1 Science data:
  • SEM data *(wrongly listed!)*
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  • STOF High Basic Rates
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  • Matrix Rates
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  • Diagnostic

Continuous level 1 data set could be provided by the PI group (at some point)
However, only some events usable, the rest is high noise.
Manpower: some months (?)
HSTOF: High energy part of STOF

- Level 1 Science data:
  - Energetic Neutral Hydrogen: 1 file only
- Level ASCII (up to May’18)
  - Matrix Rates
  - Matrix Elements

There does not exist real Level 1 data
SEM: Solar Extreme Ultraviolet Monitor

- EUV flux
  - 17-170 nm
  - 30.4 nm He II line

- Level 1 Science data:
  - Nothing (SEM listed under STOF, but data set not complete)

- Level ASCII
  - Nothing
SEM: Solar Extreme Ultraviolet Monitor
• EUV flux
  • 17-170 nm
  • 30.4 nm He II line

• Level 1 Science data:
  • Nothing (SEM listed under STOF, but data set not complete)

• Level ASCII
  • Nothing

Ascii data available here:

SEM has been successfully working onboard the NASA/ESA Solar and Heliospheric Observatory (SOHO) since Dec 1995.
SEM provides a major contribution to Extreme Ultraviolet (EUV) solar variability studies.
Calibrated EUV SEM data at:
https://drive.google.com/open?id=0B535AjktTXWldXE2NxEwUXJleXc
are extensively used by the Solar and Space Weather Communities to predict satellite drag, Earth ionosphere changes, and as a constraint on solar photon flux models.
SEM: Solar Extreme Ultraviolet Monitor

- EUV flux
  - 17-170 nm
  - 30.4 nm He II line

- Level 1 Science data:
  - Nothing (SEM listed under STOF, but data set not complete)

- Level ASCII
  - Nothing

Ascii data available here: daily files until 2017
https://dornsifecms.usc.edu/space-sciences-center/download-sem-data/
SOHO/CELIAS/PM

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  - Proton (21 Jan 1996 - 21 Feb 2000)
  - Description of data product not clear

What? Speed, density...?
- Level 1 Science data:
  - Proton (21 Jan 1996 - 21 Feb 2000)
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- Level ASCII (up to May’18)
  - Radial Spectra
  - Radial-Theta Array
  - Theta-Array
  - Rates
SOHO/CELIAS/PM

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Ascii data available here:

http://umtof.umd.edu/pm/crn/

Data ordered by Carrington rotation, available up to Jan 2019!
Digital Processing Unit (DPU)
Strangely listed as detector

- Level 1 Science data:
  - Nothing (ok)
- Level ASCII (up to May’18)
  - Housekeeping
  - Telemetry Dataset
Summary

• SOHO/CELIAS

• FTP data access instead of JAVA app
• update of data sets
• instrument + data documentation missing
• Some Level 1/high level data products could be provided by PI group in Kiel
• SEM & PM data online available