

# COSPIN / HET - User Notes

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## COSPIN/HET Contact:

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## Rates Data

### SPIN-AVERAGED RATES DATA

RECORD FORMAT:

C FREE FORMAT

READ(1,\*)IYEAR,IDOY,IHOUR,IMIN,

. H1,H2,H3,H4,H5,

. H6,H7,H8,

. H9,H10,H11,H12,H13,

. YEAR,DOY

C FIXED FORMAT

READ(1,100)IYEAR,IDOY,IHOUR,IMIN,

. H1,H2,H3,H4,H5,

. H6,H7,H8,

. H9,H10,H11,H12,H13,

. YEAR,DOY

100 FORMAT(3X,I2,X,I3,2(X,I2),13(X,E10.3),X,F12.8,X,F9.5)

PARAMETER LIST:

IYEAR: year

IDOY: day of year  
IHOUR: hour  
IMIN: minute  
H1: protons (5-14 MeV)  
H2: " (14-19 MeV)  
H3: " (24-31 MeV)  
H4: " (34-68 MeV)  
H5: " (68-92 MeV)  
H6: electrons (1-3 MeV)  
H7: " (5-10 MeV)  
H8: " (3-5 MeV)  
H9: protons (>92 MeV)  
H10:  $Z \geq 3$  (26-36 MeV)  
H11:  $Z \geq 3$  (44-127 MeV)  
H12:  $Z \geq 3$  (127-173 MeV)  
H13:  $Z \geq 3$  (>173 MeV)  
YEAR: decimal year  
DOY: decimal day of year

COUNT RATE UNITS: (/s)

TIME RESOLUTION: 10 minutes

NOTES:

Geometric factors can be found in the reference Simpson et al., *Astrophys. Sp. Sci.*, v92, pp365-399, 1992.

The energy range for the  $Z \geq 3$  channels are for carbon 12.

All rates listed as counting protons are also sensitive to nuclei with  $Z > 1$  having the same penetrating power as protons in the energy range counted by the rate

The following channels may also be sensitive to electrons:

H1: electrons (0.35-1.0 MeV)  
H3: " (3-5 MeV)  
H4: " (5-10 MeV)  
H5: " (10-16 MeV)  
H9: " (>16 MeV)

Bad or missing data are flagged by a negative value

## 8-SECTORED RATES DATA

RECORD FORMAT:

C FREE FORMAT

```
READ(1,*)IYEAR,IDOY,IHOUR,IMIN,  
.   H45S1,H45S2,H45S3,H45S4,  
.   H45S5,HRTS6,H45S7,H45S8,  
.   H7S1,H7S2,H7S3,H7S4,  
.   H7S5,H7S6,H7S7,H7S8,  
.   YEAR,DOY
```

C FIXED FORMAT

```
READ(1,100)IYEAR,IDOY,IHOUR,IMIN,  
.   H45S1,H45S2,H45S3,H45S4,  
.   H45S5,HRTS6,H45S7,H45S8,  
.   H7S1,H7S2,H7S3,H7S4,  
.   H7S5,H7S6,H7S7,H7S8,  
.   YEAR,DOY
```

100 FORMAT(3X,I2,X,I3,2(X,I2),16(X,E10.3),X,F12.8,X,F9.5)

PARAMETER LIST:

IYEAR: year  
IDOY: day of year  
IHOUR: hour  
IMIN: minute  
H45S1-F45S8: protons (34-92 MEV) IN 8 45 degree sectors  
H7S1-H7S8: electrons (5-10 MeV) IN 8 45 degree sectors  
YEAR: decimal year  
DOY: decimal day of year

COUNT RATE UNITS: (/s)

TIME RESOLUTION: 10 minutes

NOTES:

Geometric factors can be found in the reference Simpson et al., *Astrophys. Sp. Sci.*, v92, pp365-399, 1992.

The channels H45S1-H45S8 may also be sensitive to nuclei with  $Z > 1$  having the same penetrating power as protons in the range 34-92 MeV, as well as to electrons in the approximate energy range 5-16 MeV.

Bad or missing data are flagged by a negative value

## PHA Derived Data

### Description of Daily Flux Data for the COSPIN High Energy Telescope (HET)

This file contains daily average fluxes ( $\text{cm}^2 \text{ s sr MeV/n}^{-1}$ ) of protons and helium nuclei stopping in the detectors K1-K6 of the Ulysses COSPIN High Energy Telescope (HET). The HET is described in detail by Simpson et al. (Astron. & Astrophys., vol 92, pp. 365-399, 1992).

The particles contributing to these fluxes have been identified by pulse height analysis. Therefore even in quiet times, when backgrounds dominate the counting rates, it is possible to separate the very low fluxes of protons and helium from the backgrounds in the telescope.

The energy intervals are as shown in the titles and correspond to particles which trigger exactly the same detectors in the telescope that are required to produce counts in the counting rates H4 (no penetration beyond K3) and H5 (no penetration beyond K6). By comparison of A) the total PHA events with detector triggers identical to those required for the H4 and H5 counting rates to B) the measured H4 and H5 counting rates, fluxes can be derived even though the PHA information is returned for only a small fraction of the incident events.

The errors shown, also in units of ( $\text{cm}^2 \text{ s sr MeV/n}^{-1}$ ), correspond to 1 sigma counting errors, assuming Poisson statistics. Additional systematic uncertainties due to such effects as the variation of effective geometric factor with energy, or the variation in the minimum and maximum energies contributing to the counting rates as a function of angle of incidence, are difficult to estimate precisely but are probably of the order of 10-20 percent.

Missing or invalid data are represented by values of -1, as are meaningless fields such as the error on a measured flux of zero (no events registered during the accumulation interval). In some cases, particularly during solar particle events when the overwhelming majority of incident particles are low energy protons, competition for telemetry may lead to no events being registered in the higher energy proton or helium energy bins even though their true fluxes may be significantly elevated above quiet time levels.

The times, given as fractional year after 1900.0 and as fractional day of year (noon Jan. 1 = 1.5) correspond to the midpoints of the accumulation intervals.

#### Column Contents

- 1 Fractional year - 1900
- 2 day of year
- 3 H4 proton flux (39-70 MeV)
- 4 Error for H4 protons
- 5 H5 proton flux (71-94 MeV)

- 6 Error for H5 protons
- 7 H4 helium flux (39-71 MeV/n)
- 8 Error for H4 helium
- 9 H5 helium flux (72-95 MeV/n)
- 10 Error on H5 helium