Accessing data from: magswe_data_64sec_2289.hdf

The File Description is

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 Created by the ACE Science Center (ASC) --
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For more info email us at: asc@srl.caltech.edu

Data error is less than 0.1 nT (where nT is nano-Tesla).

The timing data indicates the start of the integration period in Universal
Time (UT) and is:

        year    -       int32 year
        day     -       int32 day of year
        hr      -       int32 hour of day
        min     -       int32 minute of hour
        sec     -       float32 seconds (accurate to millisec)
        fp_year -       float64 fractional year
        fp_doy  -       float64 fractional day of year
        ACEepoch-       float64 ACE epoch time in seconds since Jan 1, 1996
                        at 0hr UT

MAG -

The averaged Mag data, which are all float32, are:

        Br      - The r component of the magnetic field vector in the RTN
                  coordinate system in nT
        Bt      - The t component of the magnetic field vector in the RTN
                  coordinate system in nT
        Bn      - The n component of the magnetic field vector in the RTN
                  coordinate system in nT
        Bmag    - The <|B|> magnetic field magnitude in nT
        Delta   - The angle in degrees with 0 at Br/Bt plane + toward Bn
                  (-90 to +90 degrees), i.e. the RTN latitude
        Lambda  - The angle in degrees with 0 at Br and + toward Bt
                  (0 to 360 degrees), i.e. the RTN longitude
        Bgse_x  - The x component of the magnetic field vector in the GSE
                  coordinate system in nT
        Bgse_y  - The y component of the magnetic field vector in the GSE
                  coordinate system in nT
        Bgse_z  - The z component of the magnetic field vector in the GSE
                  coordinate system in nT

The averaging of 16 sec data to form the longer time period data
(64sec, 4min, 1hr, 1day, and Bartels rotation) is simply:

        Average = Sum(Mag data)/(Number of samples)

for the good data during the period.


Information about the Mag data, float32 except as noted:

        dBrms   - RMS values of underlying high-resolution measurements in nT.
                  This is the rms variation of the vector over the time
                  interval, calculated as follows:
                        1) calculate the average magnitude of each of the three
                           components of the vector, over the time interval.
                        2) for each component, average the square of the
                           difference between the measurement and the average
                        3) add the averages from the three components
                        4) take the square-root of the result.
                  i.e.

                       dBrms = sqrt(sum_i<(B_i-)^2>)
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For the 16-second averages, dBrms is calculated using the the highest resolution data (3 vectors/second, from one of the two sensors). For the 4-minute and hourly averages, the 16-second averages are used as input to the calculations.

The data quality for the period (int32); data of type 2 have been excised, i.e. replaced with fill data (-999.9):

Quality = 0 Normal data
= 1 Spacecraft Maneuver & subsequent high-nutation period (~4 hr)
= 2 Bad data/missing data

For daily and Bartels rotation averages, only Bmag data is valid. For Br, Bt, Bn, Delta, Lambda, Bgse_x, Bgse_y, and Bgse_z, the fill value (-999.9) is output. Individual vector components on timescales longer than 1 hour are considered to be potentially misleading and have questionable value at 1 AU. For this reason, they are not computed. Values of <|B|> may be more useful, but the user is cautioned to examine the dBrms value for these intervals as large values of dBrms may indicate significant changes in the magnetic field during the averaging interval.

SWEPAM -

The sector average values as float32 are:

proton_density - Proton density in 1/cm^3
proton_temp - Proton Temperature in degrees Kelvin
He4toprotons - Alpha particles to proton density ratio
proton_speed - Proton speed in km/s

x_dot_GSE - x GSE component of proton speed
y_dot_GSE - y GSE component of proton speed
z_dot_GSE - z GSE component of proton speed

x_dot_RTN - r GSE component of proton speed
y_dot_RTN - t GSE component of proton speed
z_dot_RTN - n GSE component of proton speed

The averaging of 64 sec data to form the longer time period data (1hr, 1day, and Bartels rotation) is simply:

Average = Sum(flux)/(Number of samples)

for the good fluxes during the period.