Juno Magnetometer

Addendum to:

The Juno Magnetometer (MAG) Standard Product Data Record and Archive Volume Software Interface Specification (SIS)

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Note : This Addendum provides a description of additional Juno magnetic field data files submitted to the Planetary Data System for archive. These files contain a machine-readable (ASCII) listing of magnetic field data in the same format as files described in detail in the SIS. They are specific to brief intervals of time during which a satellite flyby occurred and provide data and ancillary information in coordinate systems relevant to the flyby (satellite-centered systems). They are provided for the convenience of users, supplemental to the data provided in Jupiter-centric coordinate systems.

1 Introduction

This addendum to the Juno Magnetic Field Investigation Software Interface Specification (SIS) provides a convenient, machine-readable listing of the Juno magnetic field data in the same format as files described in detail in the SIS, but rendered in other coordinate systems that users may find more suitable for their needs. The original Mission Plan did not anticipate a series of close flybys of the satellites of Jupiter (Ganymede, Europa, Io) so no provision was made for archiving magnetic field data and ancillary data in coordinate systems centered on the satellites. With this addendum, we do so. These files are in addition to the standard full-day files already archived, in Jupiter-centric coordinate systems, described in the SIS.

2 File Format and Filename Additions

The Juno mission primarily uses Jupiter as the default target body, but finding it useful to provide data in another coordinate system – for example, planetocentric coordinates for the satellite Ganymede – this is specified by inclusion of the option "-ganymede" among the options on the command line. The option "-odl" instructs the program to output the attached header. The base coordinate system for rendering magnetic field and spacecraft position is the J2000 coordinate system. From J2000 we transform into other coordinate systems specified by command line option (-pc) and target body; where no option for target body is specified output variables such as the magnetic field vector ("ob_b") and spacecraft position ("posn") or state vector ("state") are rendered in a coordinate system centered on Jupiter. For example, the command line:

-odl -ganymede -pc time dday ib_b posn

results in a magnetic field vector from the inboard (range 0) magnetometer and spacecraft position rendered in Ganymede-centered IAU coordinates; pc files for Europa and Io are generated with target body options -europa and -io, respectively.

Satellite-specific files (e.g., 'fgm_jno_l3_2021158pc_ga_r1s_v01.sts') will be identified via the '_xx_' string in the filename, where "ga" identifies this as a file for the Ganymede flyby, and by the year ('YYYY') and day of year ('DDD') of the day in which the flyby occurred. Files containing flyby data for Europa ("_eu_") and Io ('_io_') shall be identified in the same manner. To find the satellite-specific (supplementary) files, simply search among file names for the imbedded satellite identifier.

References:

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