

**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 Juno magnetic field models submitted to the Planetary Data System for archive. These files contain a machine-readable (ASCII) listing of magnetic field models fitted to Juno magnetometer data (as published or soon to be published). This material may be provided in advance of publication to facilitate Project planning and to satisfy the FAIR-enabling repository requirement for papers in the review cycle. Please treat the contents with confidentiality prior to publication.

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 models as published, or as soon to be published, in the scientific literature. The models described here are spherical harmonic models described in detail the references provided below.

2 Magnetic Field Model File Format

The magnetic field model files are standard ASCII text files consisting of a variable number of records depending on the degree of the harmonic expansion and whether the model contains both internal spherical harmonics and external spherical harmonics. All fields are separated with blanks.

Record 1 provides 1 or 2 integer fields followed by a comment field. The first integer is the degree of the internal field expansion (“nint”, in this example, 30) and the second integer, if present, provides the degree of the external field expansion if appropriate (“next”, in this example, 1).

Record 2:end provides a Schmidt-normalized coefficient in units nanoteslas (nT), followed by the corresponding resolution matrix element in parentheses, and coefficient designation (e.g., g_n^m or h_n^m). A record that completes the coefficients of degree n (where n is an integer from 1 to nint) also contains the normalized Lowes’ amplitude for that degree.

A sample of the first few records (**JRM33.mod**) follows:

```
30 1 JUPITER RJ= 71,492. rcore=0.8, r=[2.,2.5], l30 E1, 620ev, Jun 28, 2021
  1 410993.4 (1.0) g 1 0
  2 -71305.9 (1.0) g 1 1
  3 20958.4 (1.0) h 1 1 1.00000
  4 11796.7 (1.0) g 2 0
  5 -56972.4 (1.0) g 2 1
  6 48250.2 (1.0) g 2 2
  7 -42549.0 (1.0) h 2 1
  8 20221.5 (1.0) h 2 2 0.06821
  9 2799.3 (1.0) g 3 0
 10 -37488.4 (1.0) g 3 1
 11 15396.8 (1.0) g 3 2
 12 -1489.8 (1.0) g 3 3
 13 -32890.6 (1.0) h 3 1
 14 42518.4 (1.0) h 3 2
 15 -27397.7 (1.0) h 3 3 0.06068
 16 -34402.0 (1.0) g 4 0
 17 -8080.8 (1.0) g 4 1
 18 -2440.5 (1.0) g 4 2
```

References:

- Connerney, J.E.P., Benn, M., Bjarno, J.B., Denver, T., Espley, J., Jorgensen, J.L., Jorgensen, P.S., Lawton, P., Malinnikova, A., Merayo, J.M., Murphy, S., Odom, J., Oliverson, R., Schnurr, R., Sheppard, D., & Smith, E.J. (2017). The Juno Magnetic Field Investigation, *Space Sci. Rev.*, doi: 10.1007/s11214-017-0334-z.
- Connerney, J.E.P., Kotsiaros, S., Oliverson, R.J., Espley, J.R., Joergensen, J.L., Joergensen, P.S., et al. (2018). A new model of Jupiter's magnetic field from Juno's first nine orbits. *Geophys Res. Lett.*, 45, doi:10.1002/2018GL077312.
- Connerney, J. E. P., Timmins, S., Oliverson, R.J., Espley, J.R., Joergensen, J.L., Kotsiaros, S., Joergensen, P.S., et al., (2021), A new model of Jupiter's magnetic field at the completion of Juno's prime mission", *J. Geophys. Res. – Planets*, submitted.