

# Juno M-Shell

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## 1. Dataset

The files *jno\_mshell\_orb1-56.pdf* and *jno\_mshell\_tseries\_orb1-56.pdf* show the Juno M-Shell calculated with the JRM33+CON2020 model between PJ1 (2016-08-27) and PJ56 (2023-11-22) with a 1-s resolution.

The M-shell is the distance to the center of Jupiter of the point of minimum magnetic field strength along the field line (also known as the magnetic equator), normalized by the planetary radius ( $1 R_J = 71,492$  km). The M-Shell is computed by iteratively tracing the magnetic field lines with a constant step size of  $1/250 R_J$  until a local minimum of magnetic field strength is found. The 13<sup>th</sup>-order JRM33 model and an analytical version of CON2020 using parameters derived in Connerney et al. (2020) are used for the calculations.

The complete dataset, its description and the numerical models used for these calculations are available at <https://github.com/jonasrabia/Juno-M-Shell>.

## 2. Plots description

- *jno\_mshell\_orb1-56.pdf* : M-Shell values are represented along Juno's trajectory, plotted in cylindrical magnetic coordinates, for each perijove. CON2020 coordinate system is used, which has a z-axis tilted by  $9.3^\circ$  toward longitude  $\lambda_{S3RH} = 155.8^\circ$ . Large and small dots highlight Juno's position every day and hour, respectively. The corresponding day of year (DOY) is indicated for each new day. Magnetic field lines connected to the orbit of Io ( $R = 5.89 R_J$ ), Europa ( $R = 9.38 R_J$ ), Ganymede ( $R = 14.97 R_J$ ), Callisto ( $R = 26.3 R_J$ ) and the outer limit of the calculation ( $R = 30 R_J$ ) are displayed as gray lines.
- *jno\_mshell\_tseries\_orb1-56.pdf* : M-Shell values are represented as a function of time, for each perijove.