Geophysical Research Abstracts
Vol. 20, EGU2018-13643, 2018
EGU General Assembly 2018

Concerning the Offset Dipole Magnetic Field of Planet Mercury

Daniel Heyner
TU Braunschweig, Institut für Geophysik und extraterrestrische Physik, Braunschweig, Germany (d.heyner@tu-bs.de)

The MESSENGER mission revealed an asymmetry in the magnetic field of planet Mercury. In the far field, the magnetic equator is offset northwards by 0.19 planetary radii.
The magnetic field inside the magnetosphere was only measured in the northern hemisphere, thus internal and external Gauss coefficients may not be determined independently without the aid of a magnetospheric model. This magnetospheric model in turn requires an internal dipole field. The effect of taking this offset-dipole model determined from the far-field measurements as initial assumption for the magnetospheric model utilized in the spherical harmonic analysis for the internal field is examined for a possible bias. In the analysis, all magnetic field data from entire mission is used. It is found that the bias effect is mainly visible in the quadrupolar and octupolar Gauss coefficients. These new values are extrapolated to the core-mantle boundary to demonstrate the required field asymmetry produced by dynamo models designed to explain the still peculiar magnetic field of Mercury.