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The Mie representation for Mercury's magnetospheric currents

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Poloidal–toroidal magnetic field decomposition is a useful application of the Mie representation for the reconstruction of Mercury's internal magnetic field. In addition, the decomposition method enables us to determine the current density observationally and unambiguously in the local region of magnetic field measurement. The application and the limits of the decomposition method are tested against the Mercury magnetic field simulation in view of BepiColombo's arrival at Mercury in 2025. The simulated magnetic field data are evaluated along the planned Mercury Planetary Orbiter (MPO) trajectories and the current system that is crossed by the spacecraft is extracted from the magnetic field measurements. Afterwards, the resulting currents are classified in terms of the established current system in the vicinity of Mercury.

Reference

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