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A framework for studying the dispersion of CMEs

Coronal Mass Ejections (CMEs) are massive eruptions of plasma along with strong magnetic fields that have the potential to significantly affect Earth’s magnetosphere, producing geomagnetic storms (GMSs) when high-energy particles in the plasma interact. Thus, it is essential to investigate the basic dynamics of CME evolution, propagation, and interaction with the ambient solar wind, to forecast space weather impacts, and reduce the CME hazards to contemporary infrastructure. In this work, we attempt to create a framework to model the CME propagation in the interplanetary medium, and its subsequent interaction with Earth’s magnetosphere. This work is motivated by the increasing demand for safeguarding the vast technological infrastructures such as power grids, navigation systems, and satellite operations ground-based and satellite technologies from GMSs caused by CMEs that endanger by advancing the current understanding in space weather studies.

Field of contribution

Phenomenology

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