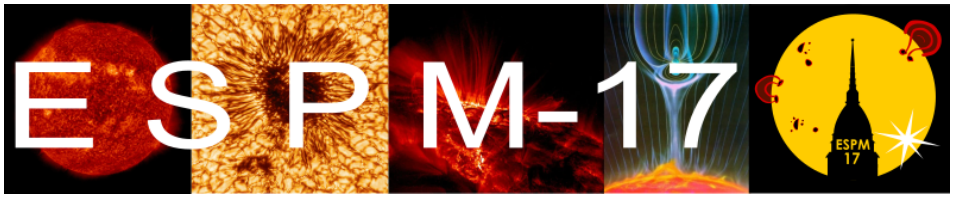

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Modeling the Propagation of CMEs with COCONUT: Implementation and application of the RBSL Flux Rope Model

Coronal mass ejections (CMEs) are rapid eruptions of magnetized plasma that occur on the Sun. They are known to be the main drivers of adverse space weather. The accurate tracking of their evolution in the heliosphere in numerical models is of the utmost importance for space weather forecasting. We implement the RBSL flux rope model in COCONUT, a new global coronal MHD modeling, to simulate the propagation of CMEs resulting from the eruptions of the flux rope with a complicated shape from the solar surface to 25 solar radii. Hereafter, we investigate the impacts of the morphology of flux ropes on their resulting CMEs. As such, we can establish a bridge between the CMEs at 20 solar radii and their progenitors in solar source regions.his work demonstrates the potential of the RBSL flux rope model in reproducing CME events that are more consistent with observations. Our findings strongly suggest that magnetic reconnection during the CME propagation plays a critical role in destroying the coherent characteristics of a CME flux rope.

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