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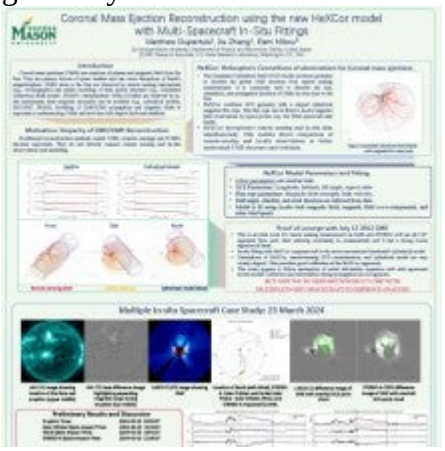
HeXCor is a new reconstruction model for coronal mass ejections (CME) that combines remote-sensing measurements of CMEs close to the Sun with in-situ observations at greater distances (such as 1AU) and relates the morphologies of the CME and its flux-rope. We validate this model with several case studies from 2010-2014 of Earth-affecting CMEs that were seen in the corona by at least two spacecraft with large separations (SOHO, STEREO A/B) and observed in-situ by Wind. The level of agreement between the remote-sensing measurements, with the assumption of radial expansion, and the in-situ fittings provides insights into the accuracy of the former measurements as well as the evolution of CMEs during expansion to 1AU. We further show developments of HeXCor to perform multi-spacecraft in-situ fittings for improved analysis of CME evolution and propagation. Our work results in a more realistic CME model that comprises accurate 3D geometry as well as the internal magnetic field.


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