

Statistical analysis for CME topology in the low corona

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The direction of magnetic vectors within coronal mass ejections, CMEs, has significant importance for forecasting terrestrial behavior. We have developed a technique to estimate the time-varying magnetic field at Earth for periods within CMEs (Savani et al 2015, 2016). The technique can be regarded as the aggregate from two significant contributions: 1) Estimating the initial topological structure of the CME and 2) Estimating the hypothetical Earth-trajectory after CME evolutionary effects have been considered. In this presentation, we study the applicability of using a simplified scheme to estimate the CME topology from two parameters; the solar cycle and solar hemisphere. We show that statistical improvements for estimating the CME topology can be made by including additional parameters for more complex events that occur less frequently. We describe how identifying the polarity of the leading edge from post flare arcades at the source of the CME is an example of one of these parameters.

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