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Subjective Uncertainties in 3-D Coronal Mass Ejection Fitting Prediction

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Graduated Cylindrical Shell (GCS) model is a widely used tool to determine direction, kinematic viewpoint observations from SOHO and STEREO A&B coronagraphs. In this study, we estimate by comparing the GCS model results reported in multiple studies and catalogs for 56 CMEs. We uncertainty of 5.7, 11.2, and 24.7 degrees with standard deviation of 5.5, 12.7, and 19.7 degree correlated with uncertainties in estimated longitude, tilt, and speed, showing that some CMEs a values in our 3-D magnetohydrodynamic flux rope based modified spheromak CME model to fit better CME observations are required to reliably predict magnetic field of CMEs at 1 AU using fit result in large differences in 1 AU signatures, especially for CMEs launched away from the Sun

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