

[구SS-17] Comparison of geometrical methods to identify CME 3-D structures

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Several geometrical models (e.g., cone and flux rope models) have been suggested to infer 3-D parameters of CMEs using multi-view observations (STEREO/SECCHI) and single-view observations (SOHO/LASCO). To prepare for when only single view observations are available, we have made a test whether the cone model parameters from single-view observations are consistent with those from multi-view ones. For this test, we select 35 CMEs which are identified as CMEs, whose angular widths are larger than 180 degrees, by one spacecraft and as limb CMEs by the other ones. For this we use SOHO/LASCO and STEREO/SECCHI data during the period from 2010 December to 2011 July when two spacecraft were separated by 90 ± 10 degrees. In this study, we compare 3-D parameters of these CMEs from three different methods: (1) a triangulation method using the STEREO/SECCHI and SOHO/LASCO data, (2) a Graduated Cylindrical Shell (GCS) flux rope model using the STEREO/SECCHI data, and (3) an ice cream cone model using the SOHO/LASCO data. The parameters used for comparison are radial velocities, angular widths and source location (angle γ between the propagation direction and the plan of the sky). We find that the radial velocities and the γ -values from three methods are well correlated with one another ($CC > 0.8$). However, angular widths from the three methods are somewhat different. The correlation coefficients are relatively not good ($CC > 0.4$). We also find that the correlation coefficients between the locations from the three methods and the active region locations are larger than 0.9, implying that most of the CMEs are radially ejected.