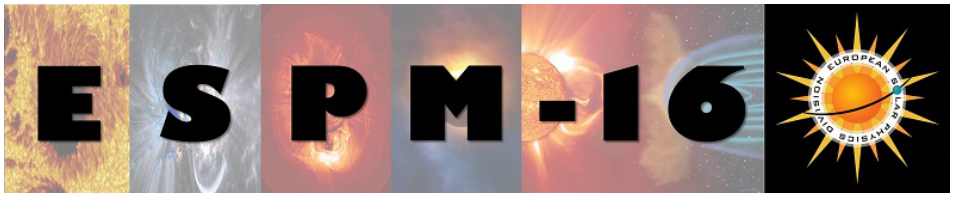

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Multispacecraft CME event modelled with EUHFORIA: translating observations to model input parameters

Tuesday 7 September 2021 09:00 (13 minutes)

Solar eruptions, such as flares and coronal mass ejections (CME), are key drivers of space weather phenomena. CMEs are large plasma eruptions, with magnetic flux ropes frozen-in the plasma. They can travel within the heliosphere with speeds from a few hundred up to 1000 km/s and can have a profound impact on the near-Earth environment, as well as human activity in space and on ground. Modelling and successfully reconstructing CMEs is essential for space weather forecasting purposes. In this study we investigate the implementation of the spheromak CME-type flux rope model used in EUHFORIA (EUropean Heliospheric FORecasting Information Asset). To this purpose we select a CME event from the 6th of January 2013 as a test case. We translate the observable properties of the CME into model inputs. Particular attention is given in translating the observed angular widths of the CME, as captured in white-light images, to a spheromak radius. In addition, we investigate the insertion angle of the spheromak necessary to capture the observed magnetic field topology at the source region. To assess the model output, we compare it with in-situ observations at two spacecraft locations, Venus Express (~0.7 AU) and STEREO-A (1 AU), which were radially aligned during the eruption. To further understand the modelling results we conducted detailed investigations on the dynamics of the magnetic structure as it propagates.

Student poster?

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