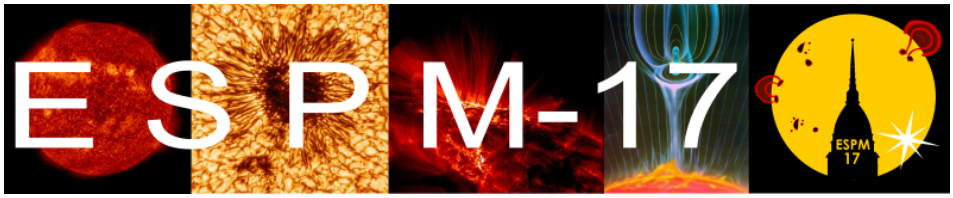

Contribution ID: **27** Type: **Poster**

Deceleration of CMEs between Mercury and Earth tested by EUHFORIA/ICARUS MHD simulations

Coronal Mass Ejections (CMEs) are the main drivers of the disturbances in interplanetary space. Then, understanding CMEs is crucial for advancing space weather studies. Assessing the numerical heliospheric model capabilities is crucial, as understanding the nature and extent of the limitations can be used for improving space weather predictions. In a statistics study it was shown that among 28 cases observed by the two spacecraft located near Mercury (MESSENGER) and Earth (ACE), 22 cases show a deceleration of 160 km/s. We test this result by considering two cases using the advanced 3D MHD heliospheric modeling tool Icarus recently developed at CmPA, KU Leuven. Icarus applies the radial grid stretching and adaptive mesh refinement to the computational domain to obtain fast simulations. The source regions for the CMEs were identified, and the CME parameters were calculated and optimized. The results were compared to insitu measurements.
The first CME case erupted on SOL2013-07-09T15:24. The modeled time series were in good agreement with the observations both at MESSENGER and ACE. The second CME case, starting on SOL2014-02-16T10:24 was more complicated, three CME interactions have to be taken into account. The CME-CME interactions were modeled in the Icarus simulations, which reconstructed the observed time series much better than considering only one CME. The deceleration of the CMEs observed between Mercury and Earth and attributed to the accumulation of the solar wind plasma upstream of the ICME was not retrieved in the simulations. The modeled time-series and observations are compared for both CME events.

Primary author: SCHMIEDER, Brigitte (Observatoire de Paris)

Co-authors: Dr DEMOULIN, Pascal (Observatoire de Paris); Prof. POEDTS, Stefaan (KU Leuven); BARATASHVILI, Tinatin (KU Leuven); Dr GRISON, Benjamin (University of Prague)

Session Classification: Coffee break and poster session 2

Track Classification: Space weather and the solar-heliospheric connections