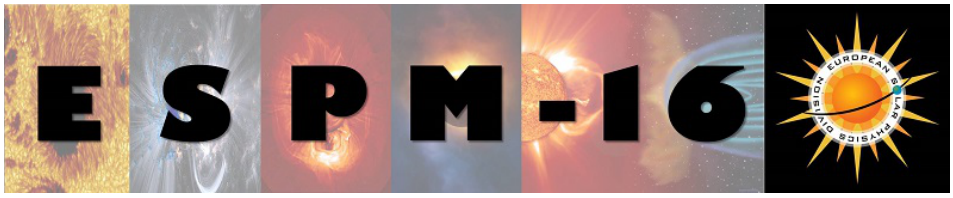

Contribution ID: **535** Type: **Poster**

Magnetized CMEs and solution adaptive mesh refinement in EUHFORIA

Thursday, 9 September 2021 11:26 (13 minutes)

Coronal Mass Ejections (CMEs) are the main drivers of interplanetary shocks and space weather disturbances. One of the key parameters that determine the geo-effectiveness of the CME is its internal magnetic configuration. Strong CMEs directed towards Earth can cause severe damage to our planet. Predicting the arrival time and impact of such CMEs can enable us to mitigate the potential damage to various technological systems on Earth.

Recently, we implemented a novel heliospheric modelin MPI-AMRVAC (Xia et al. (2018)) to improve the predictions of EUHFORIA. Our model solves the ideal MHD equations to obtain a steady state solar wind configuration in a reference frame corotating with the Sun. In addition, CMEs can be modelled by injecting a cone or magnetized CME from the inner boundary (at 0.1 AU). Our implementation in MPI-AMRVAC guarantees efficient performance by using advanced techniques such as radial grid stretching and solution adaptive mesh refinement applied in the inner heliospheric domain.

In this study, we consider the effects of a magnetized CME in the heliosphere. The linear force-free spheromak model from EUHFORIA is injected into the recently-developed heliospheric model in MPI-AMRVAC. We investigate its effect upon interaction with the solar wind. The time series of different variables at L1 are compared to the already-existing spheromak model simulation results in EUHFORIA.

This research has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 870405 (EUHFORIA 2.0).

Primary author: Ms BARATASHVILI, Tinatin (KU Leuven)

Co-authors: POEDTS, Stefaan (KU Leuven); VERBEKE, Christine (Solar-Terrestrial Centre of Excellence—SIDC, Royal Observatory of Belgium)

Presenter: Ms BARATASHVILI, Tinatin (KU Leuven)

Session Classification: Poster Session 10.6

Track Classification: Session 5 - Solar-Terrestrial Relations, Solar Wind, Space Weather and Space Climate