



Contribution ID: 239

Type: Poster

Comparative analysis of the open and closed field topologies reconstructed by different coronal models

When reconstructing the coronal magnetic field topology, which is an essential input to heliospheric space weather forecasting models, one can choose among many coronal models. These range from simple empirical to state-of-the-art magnetohydrodynamic (MHD) models. In this study we try to address how well coronal models agree well with each other regardless of their complexity and simulation set up. In addition, we investigate for each model the sensitivity of the simulation output with respect to variations of the initial set up. We considered four potential field source surface (PFSS)-based models and one full MHD model, all of which were initiated with two different types of HMI ADAPT magnetograms generated for three consecutive dates. One magnetogram included active regions added retrospectively while the other did not. All PFSS based outputs were compared to the one generated by the MHD model. This analysis revealed that all models considered here produce very comparable open and closed field topologies. Taking the work one step further, we selected a coronal hole that was centered within the Earth's field of view, for the three dates studied, and compared its area with the simulated open field topology associated with it. We found that they do not compare well. As a conclusion, despite not agreeing well with observations, simulated topologies from different coronal models agree well with each other.

This work is the result of collective research by members of the International Space Science Institute (ISSI) team "Magnetic Open Flux And Solar Wind Structuring Of Interplanetary Space".

Primary author: ASVESTARI, Eleanna (University of Helsinki)

Co-authors: SCOLINI, Camilla (University of New Hampshire); HENNEY, Carl (Air Force Research Laboratory, USA); ARGE, Charles N. (NASA Goddard Space Flight Center, USA); SAMARA, Evangelia (Royal Observatory of Belgium and KU Leuven); POMOELL, Jens (University of Helsinki); LINKER, Jon A. (Predictive Science Inc., USA); TEMMER, Manuela (Institute of Physics); MADJARSKA-THEISSEN, Maria (Max-Planck Institute for Solar System Research); OWENS, Mathew J. (University of Reading, UK); CAPLAN, Ronald (Predictive Science Inc., USA); PINTO, Rui (LDE3, DAp/AIM/CEA, U. Paris-Saclay); HOFMEISTER, Stefan (stefan.hofmeister@columbia.edu); Dr HEINEMANN, Stephan G. (University of Helsinki, Finland)

Session Classification: Coffee break and poster session 2

Track Classification: Space weather and the solar-heliospheric connections