

Topical Discussion Meeting report

A Topical Discussion Meeting aims at active participation or interaction between the participants. The participants work and discuss on a predefined theme or problem heading towards an outcome or target. A working meeting is a 1h 15min informal afternoon meeting with NO abstract submission form and therefore NO poster contributions.

Name of the meeting:

Probabilistic Data-Assimilative Forecast of the Near-Earth Radiation Environment

Conveners: Yuri Shprits, Melanie Burns

Data – Time – Room: Oct 26, 2022, 11:30am, Fire-Room

Nr of participants: 20

Objective of the TDM

During the meeting, the members of the Horizon2020 project PAGER present new developments and the current state of the project.

Main discussion points for this session is the importance of data assimilation, ensemble forecasting and machine learning in space weather prediction.

Some discussion highlights

The project presentation included the capabilities of the SWIFT code in producing realtime solarwind ensemble forecasts as well as CME predictions.

Based on the solarwind ensemble forecasts, predictions of the KP index are produced also as ensemble simulations. Results were shown of physics- and machine-learning based predictions of plasmasphere density, based on the VERB-CS and the PINE code.

Forecasts of the radiation belt and ring current particle flux are produced daily by the VERB code using data assimilation, with ring current forecasts provided as ensembles.

Predictions of both surface and deep electric charging of satellite infrastructure are performed with the SPIS code.

Main conclusion of the meeting

An accurate forecast of CMEs is crucial for predicting space weather effects near Earth. Ensemble simulations have the potential to mitigate the difficulties of predicting the necessary Bz parameter.

Furthermore data assimilation is a powerful tool to improve the accuracy of space weather forecasts and therefore help to increase the confidence of stakeholders in our predictions

Annexes

realtime forecasts of the PAGER project can be seen at <https://www.spacepager.eu/>