Fadil
Inceoglu
University of Colorado Boulder / NOAA
Alison Jarvis, University of Colorado Boulder
Paul T. M. Loto'aniu, University of Colorado Boulder
Aspen Davis, University of Colorado Boulder
Sarah Auriemma, University of Colorado Boulder
Poster
The Geostationary Operational Environmental Satellite (GOES) missions have been continuously measuring the Earth’s magnetic field at geostationary orbit for the past 40 years, covering nearly 4 solar cycles. The data obtained from these missions are used in operational setting by National Oceanic and Atmospheric Administration’s Space Weather Prediction Center for detecting geomagnetic storms, substorms and motion of the magnetic field through magnetopause crossings. In addition to the operational use of the magnetic field data from GOES missions, scientists all around the world use these data to study the geospacer, radiation belt dynamics, magnetosphere, and geomagnetic storms in detail.

These studies require high-quality and continuous data. Unfortunately, the magnetic field measurements from the GOES-R spacecraft shows some contamination, which sometimes reach about 20 nT, which is quite significant considering the average geomagnetic field is around 100 nT. These contaminations are observed to be caused by the Arcjet firing, which use hydrazine thrusters, for periodic orbital maneuvers to stay in the planned geostationary orbit.

In this work, we used 4 different AI methods, which are XGBoost, LightGBMs, LSTMs, and Transformer Networks. The former two methods are tree-based regressors, while the latter two are based on Neural Networks. The results show that the tree-based methods provide better results compared to those that are based on neural networks.

Poster category:

Poster category
Geospace/Magnetosphere Research and Applications
Poster session day
Thursday, April 18, 2024
Poster location
12
Meeting homepage
Space Weather Workshop 2024
Download to PDF