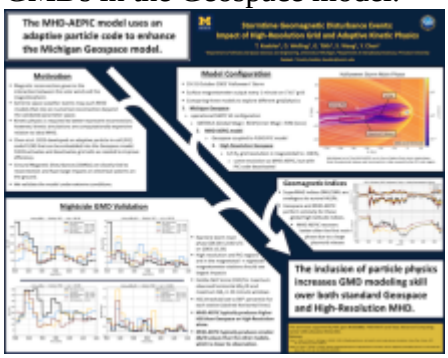
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Poster
Rapidly-changing surface geomagnetic field as a result of space weather can create harmful impacts to electrical systems via induced currents. These Geomagnetic Disturbances (GMDs) are critical to understand using numerical modeling as a predictive tool to forecast and help mitigate impacts. The Michigan Geospace model is used operationally by the Space Weather Prediction Center to produce forecasts of potentially harmful events. However, this model uses magnetohydrodynamic equations in the global magnetosphere physics domain, and a relatively coarse grid in the magnetotail. Magnetic reconnection in this domain has a large impact on GMDs by initiating substorms and associated magnetic perturbations.

To explore the impacts of model grid and physics on GMDs, we run the Michigan Geospace model in the operational configuration as a baseline for several storm-time events. Geospace is then altered to have higher grid resolution in the magnetotail, impacting resistive nightside reconnection. Finally, we compare these with the MHD with Adaptive Embedded Particle-In-Cell (MHD-AEPIC) model, which couples the FLEKS particle code with the SWMF in the magnetotail. This code features an adaptive grid that dynamically activates to cover only the plasma sheet and reconnection locations. By adding particle physics for tail reconnection, the reconnection physics changes with impacts to substorm formation and surface magnetic perturbations. Comparison between the model configurations shows the importance of magnetotail grid resolution and adaptive kinetic physics on GMDs in the Geospace model.



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