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Poster
During the space age so far, none of the geomagnetic storms that have impacted Earth's magnetosphere can be truly called extreme, nor have we witnessed the widespread destruction of technological infrastructure that may be caused by ground magnetic disturbances (GMDs) in a worst-case scenario. In the attempt to predict a 1-in-100 and 1-in-1000 year GMD event, we are therefore hampered by a lack of solar wind observations that would lead to an extreme geomagnetic storm. A commonly used approach to predicting extremes is to scale up the observations from historical storms, either the ground magnetic field data or the solar wind drivers. Using the Space Weather Modeling Framework (SWMF) to simulate geospace, we compare the GMD predictions of these two scaling methods for the Gannon storm of May 2024, scaling the storm by factors of 1.5, 2, and 3. We find that scaling the ground observations and scaling the solar wind inputs result in very different GMD predictions. We also report that scaling up the Gannon storm solar wind drivers by a factor of 3 causes the modeled geospace system to enter an unusual state which changes the interpretation of magnetic indexes like Dst. This last finding serves as a call for caution when using our familiar magnetic indexes to measure the intensity of geomagnetic storms, as the indexes may not mean what they typically do during extreme events.
Poster session day
Thursday, April 30, 2026
Poster location
33
Meeting homepage
2026 Space Weather Workshop
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