

EGU22-13037

<https://doi.org/10.5194/egusphere-egu22-13037>

EGU General Assembly 2022

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Progress On a New Interactive 3-Dimensional Data Viewer for the Enlil Solar Wind Model

Christopher Pankratz¹, Greg Lucas¹, Jenny Knuth¹, Dusan Odstrcil², James Craft¹, and Thomas Berger³

¹University of Colorado / LASP, LASP - Laboratory for Atmospheric and Space Physics, Boulder, United States of America (chris.pankratz@lasp.colorado.edu)

²George Mason University, United States of America

³University of Colorado, Space Weather Technology, Research, and Education Center

One of the critical models in space weather forecasting is the Enlil solar wind prediction model that can inform space weather forecasters the direction and speed of coronal mass ejections CMEs. The Enlil code calculates the propagation of the solar wind throughout the 3D heliosphere, but current visualization capabilities in the forecasting offices are restricted to 2D planes intersecting Earth. This limits forecasters to only be able to view CME properties that are traveling directly in the plane of the Earth.

Here, we present an update on a new visualization capability being developed to take advantage of the full Enlil 3D data volume and interactively visualize the CME expansion out of the plane of the Earth. We have been collaborating closely with researchers and forecasters at the Met Office in the UK and the Space Weather Prediction Center (SWPC) in the USA to develop a tool to enable full view of the heliosphere in a manner that can be tailored to these different types of users. To accomplish this, we are deploying the Enlil solar wind model into a scalable Cloud-based model staging platform computing environment, which will allow the full 3D Enlil output to reside in-situ with the visualization engine. We will discuss our progress in deploying and running the Enlil model in the Cloud-based testbed environment, the process of interacting directly with space weather forecasters to design a new interactive 3D visualization tool that meets their needs, and will demonstrate use of the actual visualization tool, which is deployed and running in the Amazon Web Services (AWS) Cloud environment.