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Poster
Because the state-of-the-art in density estimation, the High Accuracy Satellite Drag Model (HASDM), is restricted to use within the US Government, there is a critical need for a commercial data assimilation tool that can deliver operational nowcast and forecast densities to satellite operators for routine operations. Solari, our new data-assimilative density model, is designed to meet this need. Solari assimilates LeoLabs radar tracking data and Space Force Energy Dissipation Rates (EDRs) of calibration satellites to correct a background density model and produce a global density state. The flexible architecture of Solari allows the tool to be easily extended to include additional measurement types (i.e., satellite GNSS, nitric oxide). The first version of Solari will utilize two background density models: MSIS-00 and JB2008. The use of two background models enables the concurrent application of two widely used data assimilation approaches: space weather index estimation and exospheric temperature estimation. The end goal is an operational commercial density nowcast and forecast data stream that offers accuracy equal to or surpassing that of HASDM.

The six-month NASA SBIR Phase I results will be presented, which include a feasibility study of the radar tracking data processing tool and the transition of the Space Force EDR processing tool from a TRL 4 to a TRL 5. Details on the Solari algorithm architecture and plans for future work will also be shared.

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