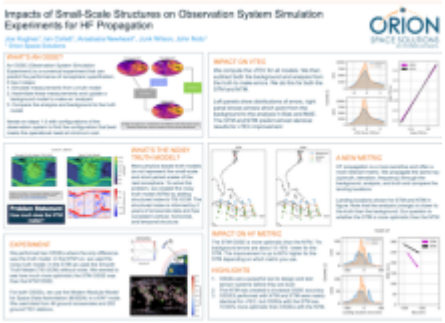
Joe
Hughes
Orion Space Solutions
Ana Newheart, OSS
Ian Collett, OSS
Cami Nasr, OSS
Junk Wilson, OSS
Poster
Observation System Simulation Experiments (OSSEs) are simulation experiments that quantitatively assess different sensor architectures for how well they meet science or operational metrics. Such assessments can be coupled to a pricing model to perform cost-benefit analyses. Many OSSEs use smooth physics-based nature runs or truth models, but these models typically lack small-scale structure that is present in the real ionosphere. This limitation can lead to overly optimistic estimates of the performance of an observation system. This is because the real-life ionosphere is not often well-modeled by a linear interpolant. Recent work has developed methods for generating ‘noisy truth models’ (NTMs) which have realistic small-scale structure to remedy this problem. OSSEs performed with a NTM ought to be more accurate since it is impossible to know how well a sensor system can resolve small-scale features if there are no small-scale features to find in the truth model.
This work will investigate the impact of the truth model on OSSE results with a High Frequency (HF) propagation metric relevant for Over The Horizon (OTH) Radar. Two OSSEs will be performed: one with a smooth truth model and one with a NTM. Both OSSEs will sample their respective truth models with the same sensors, and will use an identical assimilator. The improvement of both of the analyses over the background will be quantified and compared


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Poster session day
Wednesday, April 17, 2024
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