Clayton
Cantral
Johns Hopkins University Applied Physics Laboratory
Matthew Zuber - JHUAPL
Patrick Dandenault - JHUAPL
Robert Schaefer - JHUAPL
Larry Paxton - JHUAPL
Yongliang Zhang - JHUAPL
Rafael Mesquita - JHUAPL
Hyosub Kil - JHUAPL
Poster
Very Low Earth Orbit (vLEO), spanning altitudes from 100 km to 400 km, much closer to Earth’s surface than low Earth orbits (LEO; 400-2000 km), is a challenging yet rapidly evolving space domain with potential advantages for commercial and national security operations. The close proximity to the Earth’s surface introduces the challenge of vLEO: mitigating the impacts of the exponentially denser atmosphere on the spacecraft. This requires knowledge of the atmosphere conditions (i.e. weather) within the domain. Unfortunately, observational evidence of the weather in vLEO is currently lacking and models have not been extensively verified and validated within the domain. Here we provide a survey of the current state-of-the-art databases and models that provide atmosphere information within vLEO. We compare model predictions within the domain and assess the impacts of model differences on spacecraft orbit predictions. The results from this study are then used to assess and recommend approaches to ameliorate gaps in our understanding and capabilities to predict weather in vLEO in the context of improved operations and tracking.

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