Progress Report on Turbulence Forecasting for Uncrewed Aircraft Systems

Executive Summary

This report outlines recent progress in understanding turbulence forecasting challenges for Uncrewed Aircraft Systems (UAS). In particular, the report focuses on a case study of high resolution modelling over White Sands, New Mexico; a nested suite of 1.5km, 300m and 100m models was run over White Sands, and the model horizontal wind speed was compared with wind observations from a HALAS (High Altitude Atmospheric Sensing) LiDAR product made by Honeywell. The model comparison indicated that the 300m model performed best against the Root Mean Square Error (RMSE) metric, but more work is required to decide on the best metrics for verifying turbulence and wind prediction in high resolution models. The report finishes with future opportunities in forecasting low-level turbulence, such as using Large Eddy Simulation (LES).