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A validation test for the Acoustic Footprint Mission Planning System

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QinetiQ North America, Technology Solutions Group (QNA) and Wyle Laboratories have integrated two mature, proprietary technologies into a prototype Acoustic Footprint Mission Planning System. Wyle's Noise Model Simulation (NMSim) uses validated linear noise propagation routines in combination with ray-tracing algorithms based on weather data provided by QNA's Precision Airdrop System (WindPADS) to predict the time history of spectral noise levels from a flying aircraft at any number of user-defined receptor locations. Through interpolation over a ground-based receptor grid, the impact of noise propagated through a stratified atmosphere may be quantified in terms of audibility at any point inside the acoustic footprint. Weather data for the NMSim ray-tracing routines is extracted from the WindPADS three-dimensional forecast of wind, pressure, temperature and humidity in the atmosphere as a function of time. The three-dimensional field is the result of physical and dynamic assimilation of forecast and measured atmospheric data, with wind-forcing by the underlying terrain. This paper describes the results of a validation test performed at Yuma Proving Ground, AZ. It is shown that the noise propagation model predictions agree satisfactorily with the measurements of a C-130 cargo plane. [Work supported by Natick Soldier Center.]