Developing and Demonstrating an AFSIM Weather Capability

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ABSTRACT

Weather affects combat operations through communications, platforms, sensors, and weapon systems, driving operational planning and tactical re-planning. Weather also helps identify asymmetries in Red and Blue force capabilities. Simulated combat should be similarly affected if these simulations are to deliver value in training, mission rehearsal, analysis and acquisition. Although the Navy and Air Force have made progress in injecting weather, ocean and dynamic terrain into these simulations, these efforts are often burdened by the need to establish simulation consistency and standard engineering content across multiple legacy simulation federates. These federates often respond with a wide range of simulation fidelity in dynamic representation of these weather injects.

The Advanced Framework for Simulation, Integration and Modeling (AFSIM) provides an open environment for simulating missions from subsurface to space with several levels of model fidelity to address tactical, operational and strategic engagements. AFSIM enables rapid scenario composition from engineering to mission level excursions, providing a potentially seamless capability from acquisition to deployment. This new approach within the Air Force Research Lab offers the opportunity to more fully represent, and assess, the impact of dynamic weather on sensors and systems, and ultimately on training, mission planning and weapon system acquisition.

In this paper, we outline current Air Force and DoD efforts in natural environment representation in simulation, focused on developing an AFSIM weather capability that is both seamless within the simulation framework and consistent across simulation federates. We then demonstrate the progress to date in authoritative natural environment representation and a potential path forward for AFSIM.

BIO

Karl D. Pfeiffer is a Principal Engineer with Atmospheric and Environmental Research. Prior to joining AER Karl served as an Air Force Weather officer and military faculty at the Naval Postgraduate School, specializing in command and control (C2), numerical modeling and decision support. Karl holds an MS in Computer Science from the Air Force Institute of Technology and PhD in Atmospheric Science from North Carolina State University.