

A Decision Support Tool and Simulation Testbed for Airborne Spacing and Merging in Super Dense Operations

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Identification and Significance

- This proposed research in this SBIR effort directly supports the objectives of the NASA Airportal Project.
- The key innovation in this effort is the development of a decision support tool for distributed airborne-ground scheduling sequencing, spacing and merging of aircraft in the terminal airspace
- Will meet NASA need for a modeling and simulation testbed that will enable the evaluation of NAS wide impacts of technologies related to Super Dense Operations in the Terminal Airspace



Figure 1 Sequencing and Merging of aircraft departing from SFO, ABQ and Reno in Louisville.

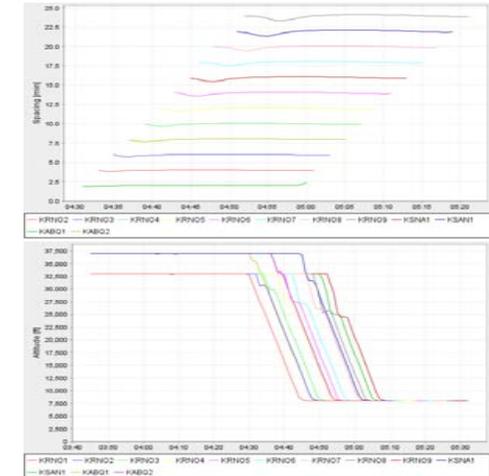


Figure 2: Aircraft Spacing and Descent Profiles

Work Plan and Objectives

- Enhancing the fidelity of the “ground-based” algorithms for generating sequencing and spacing constraints to include aspects related to, changing runway utilizations, varying arrival and departure rates, control horizons for different air portals, descent approaches for different air portals, wake vortex, and weather;
- Enhancing the “airborne” component that executes sequencing and spacing.
- Incorporation of improved “delay” maneuvers such as path stretches, holding patterns in the terminal area
- Modeling of pilot variability
- Modeling of SDO operation in metroplexes such as Chicago and Atlanta in ACES and demonstrating regional and NAS-wide benefits of the proposed approach.

NASA Application

Our initial target for the product developed in this effort is the NGATS modeling and simulation community within NASA and FAA. The proposed approach and testbed will provide a unique capability to model and simulate NGATS Airportal operations.

Non NASA Applications:

Aerospace companies developing ADS-B based automation tools for air traffic management. IAI has already identified ACSS as our initial customer and has teamed with them in this effort.

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