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A Study into the Impact of Physical Structures on the Runway Velocity Field at the Atlantic City International Airport DAVID KING JR., RUSSELL MANSON, JOSEPH TROUT, NICHOLAS DECICCO, Richard Stockton College of New Jersey, MANNY RIOS, Federal Aviation Administration — Wake vortices are generated by airplanes in flight. These vortices decay slowly and may persist for several minutes after their creation. These vortices and associated smaller scale turbulent structures present a hazard to incoming flights. It is for this reason that incoming flights are timed to arrive after these vortices have dissipated. Local weather conditions, mainly prevailing winds, can affect the transport and evolution of these vortices; therefore, there is a need to fully understand localized wind patterns at the airport-sized mircoscale. Here we have undertaken a computational investigation into the impacts of localized wind flows and physical structures on the velocity field at Atlantic City International Airport. The simulations are undertaken in OpenFOAM, an open source computational fluid dynamics software package, using an optimized geometric mesh of the airport. Initial conditions for the simulations are based on historical data with the option to run simulations based on projected weather conditions imported from the Weather Research & Forcasting (WRF) Model. Sub-grid scale turbulence is modeled using a Large Eddy Simulation (LES) approach. The initial results gathered from the WRF Model simulations and historical weather data analysis are presented elsewhere.

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