Liquid cloud testbed simulations using a novel large eddy simulation capability

Colleen M. Kaul, Kyle G. Pressel, William I. Gustafson, Christopher R. Jones

Pacific Northwest National Laboratory

Under the EAGLES project, large eddy simulation (LES) output will be used as training data for machine learning of microphysical process parameterizations for high-resolution climate modeling. This application of LES imposes a two-fold requirement: first, the LES must provide a high accuracy representation of the relevant processes and, second, the LES must be capable of simulating a variety of scenarios to provide training data of sufficient diversity. Towards this end, liquid cloud testbed regions in the Central U.S., Eastern North Atlantic, Northeastern Pacific, and Southern Ocean have been identified and observationally-based case studies are being developed. These case studies provide an opportunity both to validate the novel LES model Predicting INteractions of Aerosol and Clouds in Large Eddy Simulation (PINACLES) and to generate diverse training data sets. Here we describe the application of PINACLES to some of these testbed cases with comparisons to observations and WRF-LES simulations as available.