

Atmospheric large eddy simulation with DALES on Fugaku

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DALES is an atmospheric large-eddy simulation program used for research and education. It simulates atmospheric processes including turbulence, convection, clouds, precipitation, and radiative effects. DALES stands for Dutch Atmospheric Large Eddy Simulator.

We have ported DALES to the Fugaku supercomputer. We report on our experiences with porting the code and running the model on the new A64FX architecture. Using DALES, we investigate the organization of shallow cumulus clouds, and how it depends on the atmospheric conditions and simulation parameters such as domain size and resolution. The high performance of Fugaku and fast inter-node communication makes it possible to simulate large domains or to run simulations at very high resolution.

Keywords: large eddy simulation, Fugaku, shallow cumulus, cloud organization