



The UK's National Supercomputing Service

Turbulent times

The image shows a reproduction of the June 3rd, 2018 eruption at Fuego volcano, Guatemala. The volcanic plume reached around 15 km high, depositing ash to the north. The large-eddy simulation, which included the wind field, used the MFX-classic Eulerian (solid-gas) solver and ran on ARCHER2's 1,200 CPU cores for 40 hours (simulating 2,000 seconds of real time). A North-South (XY plane) slice shows the log10 of particle concentration, highlighting entrainment's effect on plume dilution and buoyancy. Sediment waves produced ash fall on the nearby Acatenango volcano. The topography was modeled using a Lidar digital elevation model, resampled to a 20-meter resolution. This work is a collaboration between the Geophysical Flow Lab at the University of Edinburgh, Dr Jordan Musser (NETL, US DOE), and Pr Joe Dufek (University of Oregon), aiming to reproduce complex volcanic plumes under real atmospheric conditions, including 3D wind fields.

Eric Breard, School of Geoscience, University of Edinburgh

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