

Abstract Submitted
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Large-eddy simulation of Rayleigh-Taylor mixing on the Sierra supercomputer¹ BRANDON MORGAN, JASON BURMARK, MICHAEL COLLETTE, CYRUS HARRISON, MATTHEW LARSEN, BRIAN PUDLINER, BRIAN RYUJIN, Lawrence Livermore National Laboratory — The Sierra system is Lawrence Livermore National Laboratory’s first production supercomputer accelerated by graphics processing units (GPUs). As part of the system’s initial acceptance testing in October 2018, large-eddy simulation was conducted of Rayleigh-Taylor mixing in a spherical geometry using 97.8 billion computational volumes across 16,384 GPUs on Sierra. This talk will discuss how the Sierra system enabled such a massive calculation and how the results have been used to inform development of the k - L - a - V Reynolds-averaged Navier-Stokes (RANS) model for reacting turbulence [Morgan, B. E., Olson, B. J., Black, W. J., and McFarland, J. A., “Large-eddy simulation and Reynolds-averaged Navier-Stokes modeling of a reacting Rayleigh-Taylor mixing layer in a spherical geometry.” *Phys. Rev. E* **98**, 033111 (2018)].

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