

Abstract Submitted  
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**Buoyant Turbulent Jets with Off-Source Heating. Part I: ILES Simulations** ANDREW ASPDEN, Lawrence Berkeley National Laboratory, NIKOS NIKIFORAKIS, STUART DALZIEL, University of Cambridge — Bhat and Narasimha (JFM 1996) presented an investigation of a novel laboratory experiment analogous to latent heat release during cloud formation. An acidic jet was injected into a deionized ambient, and electrodes were used to selectively heat the conducting jet fluid. We use high-resolution three-dimensional implicit LES simulations to investigate the experiment numerically. The ILES approach uses non-oscillatory finite-volume schemes to capture the inviscid cascade of kinetic energy through the inertial range, while the inherent numerical dissipation acts as an implicit sub-grid model. We first consider the implications of using the ILES approach for turbulent jets and plumes, and then examine the complex interaction between momentum, buoyancy and (acid) concentration for a turbulent jet with off-source heating. The simulations provide valuable insight into the flow structure, and motivate a reinterpretation of the experimental data.

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