

Abstract Submitted
for the DFD15 Meeting of
The American Physical Society

Plumes from vertical buoyancy sources detrain - where does it matter? RACHAEL BONNEBAIGT, DAMTP, University of Cambridge, C. P. CAULFIELD, BP Institute and DAMTP, University of Cambridge, PAUL LINDEN, DAMTP, University of Cambridge — Buildings often have heated vertical surfaces, such as patches of wall heated by sunlight. How do these heated surfaces affect the temperature stratification in a room? Using analogue laboratory experiments and a theoretical model, we investigate the stratification in a sealed, insulated space containing a vertically distributed buoyancy source. In the experiments, the source drives a turbulent plume, as in the theoretical model. However, the plume then detrains (intrudes into the ambient) at intermediate heights. This detrainment is not accounted for in current theoretical models. We compare theoretical and experimental ambient density profiles to see whether detrainment is significant for various boundary conditions on the heated wall.

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Date submitted: 24 Jul 2015

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