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Transient Flows and Stratification of an Enclosure Containing Both a Localised and Distributed Source of Buoyancy JAMIE PARTRIDGE, PAUL LINDEN, University of Cambridge — We examine the transient flow and stratification in a naturally ventilated enclosure containing both a localised and distributed source of buoyancy. Both sources of buoyancy are located at the base of the enclosure to represent a building where there is a distributed heat flux from the floor, for example from a sun patch, that competes with a localised heat source within the space. The steady conditions of the space are controlled purely by the geometry of the enclosure and the ratio of the distributed and localised buoyancy fluxes Ψ and are independent of the order buoyancy fluxes are introduced into the space. However, the order sources are introduced into the space, such as delaying the introduction of a localised source, alter the transients significantly. To investigate this problem, small-scale experiments were conducted and compared to a 'perfect-mixing' model of the transients. How the stratification evolves in time, in particular how long it takes to reach steady conditions, is key to understanding what can be expected in real buildings. The transient evolution of the interior stratification is reported here and compared to the theoretical model.

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