

Abstract Submitted
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Transients in Natural Ventilation DIOGO BOLSTER, PAUL LINDEN, University of California San Diego — We examine the natural ventilation flow which occurs when a source of buoyancy is confined within a room with vents at upper and lower levels. We use the classic single room flow considered by Linden et al. (1990). The steady state flow in the single room case is well understood. A well-mixed buoyant layer develops, whose depth is determined purely by the geometry of the vents. However, understanding the transients that occur when there are changes in the source of buoyancy is critical in modelling real life phenomena. Previous work has modelled transient natural ventilation by dividing the room into two well mixed spaces. This could be considered by some as an oversimplification since, in reality, the upper part of the room will have vertical density gradients. By taking this stratification into account in our models, we address the influence that it has in contrast to the well mixed case. In presenting a variety of cases, we consider when it might be necessary, if at all, to include this stratification in models. Finally we compare numerical and analytical solutions with the results of analogue laboratory experiments.

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