

Abstract Submitted
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Two-Way Natural Convection of Divided Statically Unstable Fluid Layers Through Small Openings¹ CHRISTIA TSAI, Florida Atlantic University — The diffusion and convection occurring between a liquid interfaces is studied extensively by many researchers, but the natural convection of unstable fluid layers through small openings has received little attention. The subject could be important in the study of leaking oil or oil release on the sea bed. The diffusion and convection across the liquid interface are studied using flow visualization techniques in conjunction with high speed photography to elucidate this particular fluid mechanics of natural convection occurring unstably. A two-way natural convection occurs in which vertical density stratification is exhibited on both top and bottom layers. In addition to the density stratification, a horizontal density gradient is formed, resulting in an internal wave near the bottom of the tank. Both single opening and multiple openings are investigated. The interactions between multiple openings are revealed. For future study, measurement and micro-beads will be added to the experiment for more detail observation. Two-way natural convection through small opening has potentials in many directions of study upon varies instabilities observed in this experiment.

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