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Convective Excitation of Internal Waves DANIEL LECOANET, Univ of California - Berkeley, MICHAEL LE BARS, IRPHE, KEATON BURNS, MIT, GEOFFREY VASIL, University of Sydney, ELIOT QUATAERT, University of California – Berkeley, BENJAMIN BROWN, LASP, JEFFREY OISHI, SUNY Farmingdale — We will present a joint experimental & computational study of internal wave generation by convection. First we describe an experiment using the peculiar property of water that its density maximum is at $4°C$. A tank of water cooled from below and heated from above develops a cold, convective layer near $4°C$ at the bottom of the tank, adjacent to a hot stably stratified layer at the top of the tank. We simulate this setup in 2D using the open-source Dedalus code (dedalus-project.org). Our simulations show that waves are excited from within the convection zone, opposed to at the interface between the convective and stably stratified regions. Finally, we will present 3D simulations of internal wave excitation by convection in a fully compressible atmosphere with multiple density scaleheights. These simulations provide greater freedom in choosing the thermal equilibrium of the system, and are run at higher Rayleigh number. The simulated waves are then compared to analytic predictions of the bulk excitation model.

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