

Abstract Submitted
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Sidewall-driven convection in a thermally and compositionally stratified fluid. KEATON BURNS, GLENN FLIERL, Massachusetts Institute of Technology, ANDREW WELLS, University of Oxford — We present direct numerical simulations of incompressible turbulent convection along a heated sidewall in a thermally and compositionally stratified fluid, as a simplified model of meltwater flows along marine-terminating glaciers. Our model considers a 2D domain that is horizontally bounded and vertically periodic, with constant background thermal and compositional buoyancy gradients. We apply a fixed thermal perturbation along one sidewall, driving upward convective plumes and horizontally spreading layers with compensating thermal and compositional buoyancy perturbations. We examine the formation and structure of these layers as the background stratification is varied from thermally to compositionally dominated, and as the sidewall is tilted away from vertical. We also examine the variations in heat flux along the sidewall that arise with the layers.

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