Abstract Submitted
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Layer formation in rotating and stratified flows SUSAN KURIEN, Los Alamos National Laboratory, LESLIE SMITH, University of Wisconsin, Madison — We present a numerical study of layer formation in forced, rotating, stably stratified Boussinesq flows. We focus on parameter regimes with buoyancy frequency N and rotation frequency f chosen such that the timescales $1/N$ and $1/f$ are at least as fast as the nonlinear timescales. The aspect-ratio of the domain is $\delta = H_d/L_d$ where H_d and L_d are the domain height and width respectively. Two sets of calculations are studied at small, nearly fixed Froude number $Fr = U/(HN) \approx 0.002$ where H is fixed at one-quarter of H_d and U is the characteristic forcing based velocity scale. The first set fixes $\delta = 1$ with N/f values ranging from 1 to 32. The second set fixes the Burger number $Bu = \delta N/f = 1$ with aspect ratio $\delta = H_d/L_d$ ranging from 1 to 1/16. We show that both rotation rate and domain aspect-ratio conspire to set the scale and structure of the layers formed in the flows.

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