



Stability regimes of density fronts

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We report experimental results on the stability of a baroclinic front generated by the spin-up of a differentially rotating lid at the surface of a rotating two-layer stratified fluid. Using a two-layer salt stratified fluid in a 2m wide annular tank, we consider the stability of the front in the parameter space set by the rotational Froude number and dissipation as defined by the ratio of the spin-down time and rotation time of the disk. The flow regimes range from axisymmetric to irregular baroclinic unstable flow. In the baroclinic unstable regimes, vortices form due to the interaction of the spontaneous emission of inertia-gravity waves with the baroclinic unstable front, These interactions lead to intense mixing and the rapid formation of intense cyclonic vortices.