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Instability of a columnar vortex in a stratified fluid

J.-B. Flór (1), B.Cariteau (2) and A. Wirth (3) LEGI-CNRS, Grenoble, flor@hmg.inpg.fr

We present experimental and numerical results on the instability of a columnar vortex in a linearly stratified fluid. The vortex is generated by a flap rotating over a certain angle. For comparison the evolution of a vortex with a Gaussien vorticity distribution is simulated numerically with a DNS code. The results reveal instability at a critical radius where the buoyancy frequency equals the vortex rotation frequency, suggesting a resonant instability. The wave lenght of this instability varies with the Froude number -based on vortex radius and maximum azimuthal velocity- in the range between 0.5 and 1.5. Outside this range the flow appears stable but other instabilities may dominate. We will discuss this instability in relation to centrifugal and elliptical instability.