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Radiative instability of a stratified Lamb-Oseen vortex XAVIER RIEDINGER, STEPHANE LE DIZÈS, PATRICE MEUNIER, IRPHE — Le Dizès and Billant have shown that a Lamb-Oseen vortex with a strong stratification along the vortex axis is inviscidly unstable. The unstable modes are radiative and extend far from the vortex core. In this work, our objective is to analyse the effects of viscosity and stratification on these unstable modes. A linear temporal stability analysis is performed using a Chebychev collocation spectral code. The equations are the linearized Navier-Stokes equations with Boussinesq approximation. We show that the instability is the strongest for a Froude number around one and that the vortex remains unstable for all Reynolds numbers. We shall explain that the stabilization for small Froude number is due to the scaling in $\frac{1}{F}$ of the most unstable wavenumber and that the stabilization for large Froude number is linked to the appearance of a critical layer. For intermediate Froude numbers, another instability mechanism due to resonances between radiative modes and Kelvin modes has been discovered .

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