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Radiative instabilities in vertically sheared rotating stratified flows CHRISTOPHE MILLET, CEA, DAM, France, FRANÇOIS LOTT, LMD, Ecole Normale Superieure, France — One of the preferential location for the breakdown of balanced dynamics are inertial levels. Across these, balanced disturbances become inertia-gravity waves in the linear approximation. In this work, we analyse how an incident potential vorticity anomaly triggers a baroclinic instability in a rotating stratified fluid with a vertical constant shear. The destabilized character of the wave emission is shown to be associated with the presence of an inertial critical layer that couples a balanced edge wave near the ground and gravity waves aloft. One striking feature of the eigenfunctions is that the gravity wave field appears to have a pronounced asymmetry in meridional wavenumber, with larger amplitudes for horizontal wave vectors pointing toward the warm air. The theoretical predictions for the frequency and growth rate of the normal modes are shown to be in good agreement with the WKB approximation for large Richardson numbers; the latter includes an exponentially small term which captures the radiation feedback in the region below the inertial level.

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