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Dynamic of a tilted vortex in a stratified fluid NICOLAS BOULANGER, Universite de Provence, PATRICE MEUNIER, STEPHANE LE DIZES, CNRS — The dynamic of a vortex tilted with respect to the stratification is investigated theoretically and experimentally for small inclination angle. Expanding the velocity with respect to the small angle we have been able to find the base flow. The main result of this analysis is the appearance of a critical layer where the angular velocity equal the Brunt-Vaisala frequency. Smoothed by viscosity this critical layer is responsible for the appearance of a vertical velocity with a strong shear and a radial variation of the density both with a strong azimuthal dependancy. This result is in good agreement with PIV measurements. Moreover shadowgraph visualisations and PIV measurements reveals the developpement of an instability which could be of K-H type due to the strong shear in the critical layer. This instability is responsible for a strong mixing and internal wave generation. Quantitative measurements remains to be done but this instability could be of great interest specifically concerning stratified turbulence.

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