Abstract Submitted
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3D measurements of inclined vortex rings interacting with a density stratification JOHAN PINAUD, JULIE ALBAGNAC, PIERRE BRANCHER, SEBASTIEN CAZIN, ZEINAB RIDA, Institut de Mcanique des Fluides de Toulouse — Vortex rings are coherent vortical structures that dominate the dynamics of numerous flows as they are generated each time an impulsive jet occurs in a homogeneous fluid. They are also considered as elementary bricks of turbulence. Their faculty to propagate along their revolution axis by self-induction confers to such structures interesting transport properties, namely, transport of momentum, mass and heat. They are therefore often qualified as good candidates for mixing. From this perspective, the present study addresses the interaction of a vortex ring with a density stratification in order to get a better understanding of the subsequent mixing mechanisms. A new 3D time-resolved technique is used and gives a highlight at short timescale on the 3D vorticity reorganization and at larger timescale on the 3D patterns of internal gravity waves forced by the impacting/penetrating vortex. The influence of the Reynolds number of the vortex ring and its angle of attack relative to isopycnals will be detailed.

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