

Abstract Submitted
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Vortex formation through inertial wave focusing¹ MATIAS DURAN-MATUTE, JAN-BERT FLOR, LEGI-CNRS, FABIEN GODEFERD, LMFA-EC Lyon — We present a novel experimental and numerical study on the formation of columnar vortical structures by inertial waves in a rotating fluid. Two inertial-wave cones are generated by a vertically oscillating torus in a fluid in solid body rotation. At the tip of the cones, there is a singular point towards which the energy of the waves gets focused. The particularity of this configuration, as compared to those of previous experiments (e.g. oscillating sphere or disc), is that the singular point's position within the fluid leads to complex non-linear wave interaction, which may lead to the formation of a localized vortex that expands in the vertical in the form of a Taylor column. Using detailed PIV measurements we consider the flow evolution from the localized wave overturning motion to the Taylor column formation as well as the inertial wave dynamics during this process. The results are discussed in the context of turbulence in rotating fluids.

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