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Linear and nonlinear fate of an axisymmetric inertial wave attractor[1] SAMUEL BOURY, THIERRY DAUXOIS, SYLVAIN JOUBAUD, PHILIPPE ODIER, Univ Lyon, ENS de Lyon, Univ Claude Bernard, CNRS, Laboratoire de Physique, F-69342 Lyon, France, EVGENY ERMANYUK, Lavrentyev Institute of Hydrodynamics, Novosibirsk, Russia, ILIAS SIBGATULLIN, Lomonosov Moscow State University, Moscow, Russia — For a few decades now, numerous studies have been devoted to the properties of inertia-gravity wave reflection. Since the angle of propagation of these waves is set by the ratio of their frequency to the buoyancy or rotation frequency, the reflection on a wall does not follow the usual Snell-Descartes law. In particular, in a confined trapezoidal domain, the wave beam experiences a focusing effect and eventually ends on a limit trajectory called attractor. Experimental and numerical studies have shown evidence of this structure for internal waves in 2D geometry. Due to the local energy focusing, nonlinear triadic cascades occur in the branches of the attractor, leading to energy transfer between scales. More recently, geometric and 3D aspects of internal wave attractors have been explored using Direct Numerical Simulations of inertial waves. The DNS pictured an axisymmetric inertial wave attractor, in a trapezoidal cylindrical domain, with focusing and defocusing effects caused by wave reflections and by the radial geometry itself. Wave instability occurs while forcing the attractor and leads to an azimuthal symmetry breakdown. Using an apparatus relevant for axisymmetric wave generation, we produce an inertial wave attractor in a cylindrical domain and we explore its properties.

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