Experimental approach a flows driven by latitudinal librations in a triaxial ellipsoid[1] JEROME NOIR, YOANN CHARLES, ETH - Zurich — Planetary cores and subsurface oceans dynamics are fundamental to derive accurate models of orbital evolution of planets and magnetic field generation. Primarily in solid body rotation, the interior fluid is subject to various sources of perturbations, thermo-chemical convection, precession and nutations, Librations of the surrounding shell or solid tides. In the present study we developed an experimental approach of the latitudinal libration in a triaxial ellipsoid. We first present the laminar regime, the direct excitation of a Poincare mode, we show that the theoretically predicted resonance frequency is well recovered and that the finite amplitude of libration leads to a non-linear shift of the asymptotic value. In a second part, we investigate the unstable regimes; we show that the underlying destabilization mechanism is in the form of a parametric resonance between pairs of inertial modes. The system exhibits two branches of parametric resonances with a bi-stability dynamics in a narrow range of parameters.

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