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Laboratory Observation of Stratorotational Instability with a Large Density Gradient BRUCE RODENBORN, RUY IBANEZ, HARRY L. SWINNEY, Department of Physics and Center for Nonlinear Dynamics, University of Texas at Austin, Austin, Texas, USA — In 2001 a new class of instabilities in vertically stratified Taylor-Couette flows was predicted by Molemaker et al. (J. Fluid. Mech. **448**, 1). Dubrulle et al. (Astron. Astrophys. **429**, 1, 2005) then showed that this phenomenon, which they named stratorotational instability (SRI), could be a source of turbulence-producing angular momentum transport in an astrophysical accretion disk. Recently Shtemler et al. (Mon. Not. R. Astron. Soc. **406**, 517, 2010) showed that the SRI is unlikely to be a primary source of turbulence, but could well be an important secondary source. We use a Couette-Taylor system to study the SRI outside of the Boussinesq limit, i.e., with large axial density gradients, as exist in accretion disks. Our measurements of torque and the spatiotemporal structure of the flow as a function of the density profile and Froude number indicate that the SRI is robust outside of the Boussinesq limit, a minimum condition for relevance to accretion disks.

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