Abstract Submitted
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Vortex rings passing through sharp density transitions[1] KEITH MERTENS, ROBERTO CAMASSA, RICHARD MCLAUGHLIN, ELAINE MONBUREAU, DAVID NENON, CASEY SMITH, CLAUDIO VIOTTI, BRIAN WHITE, University of North Carolina, Chapel Hill — In this presentation the various behaviors of a dense miscible vortex ring descending through a sharp stratification are explored. By varying experimental parameters it is found the ring dynamics can transition from those which pass through the interface to those which can become totally entrapped within the density transition, even though in all cases the ring is the most dense fluid in the system. Experimental results will outline these various behaviors and quantify this transition with an experimental phase diagram. A scaling law will be derived from dimensional considerations to predict this transition in behavior. Numerical simulations will also be presented and compared to the previous experimental results.

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