

Abstract Submitted
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Comparison of DNS Determination of the Dynamics of Vortex Rings in Viscous Fluids and Experiment RUSSELL DONNELLY, ROBERT HERSHBERGER, University of Oregon — We have been studying vortex rings in water for some time [1] and recently became aware of an important paper studying vortex rings by direct numerical simulation (DNS) from Coleman's group at Southampton [2]. There is clearly much to be learned from a comparison of the results in [1] and [2]. The first insight is a comparison of slowing vortex rings, where we find quite similar decay rates at comparable Reynolds numbers. A second insight is gained by noting that they find a time t^* needs to elapse before the core adjusts to its vorticity distribution. We find photographically that the ring needs to propagate at least one gun diameter before it adjusts its vorticity. A third insight is that the rings in Fig. 5(b) of [2] do not change much in radius, consistent with the results in Table 2 of our paper [1]. The talk will cover more recent comparisons of the two works including observations of the growth of vortex waves.

[1] I. S. Sullivan, J. J. Niemela, R. Hershberger, D. Bolster and R. J. Donnelly, *J. Fluid Mech.* 609 319 (2008).

[2] P. J. Archer, T. G. Thomas and G. N. Coleman, *J. Fluid Mech.* 598 201 (2008).

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