Abstract Submitted
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Stratified Turbulence in the Pancake Regime ADAM FINCHAM, University of Southern California — Careful application of new laser scanning velocimetry techniques has allowed for detailed, time-resolved, three-dimensional volumetric measurements of a variety of stratified flows. These measurements have confirmed the persistence of a balanced state between horizontal advection and vertical diffusion, that leads to a self similar evolution of the flow structures for late times. For example, the relatively well known stratified dipole, most of the time assumed to be quasi two dimensional, is revealed to have a complex three dimensional vortex topology arising from its self induced propagation. When the buoyancy scale approaches zero, an effective Reynolds number based on vertical diffusion and horizontal advection governs the evolution. Such dipolar structures are believed to characteristic the vortices of the fully turbulent case. Indeed, moderately high Reynolds number towed grid stratified turbulence experiments show a predominance of dipolar type structures, in agreement with recent numerical works. This *turbulent* case consists of a sea of pancake-like structures separated by highly dissipative horizontal vortex sheets. In the collapsed state, the flow evolves independently of the Froude number and is also governed by the effective Reynolds number. The extent to which viscous effects dominate the laboratory results and their agreement with recent numerical simulations will be emphasized.

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