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Roberto Camassa and **Joyce T. Lin*** (jtlin@email.unc.edu), Department of Mathematics, University of North Carolina at Chapel Hill, CB# 3250, Phillips Hall, Chapel Hill, NC 27599, and **Richard M. McLaughlin**. *Falling Spheres in Stratified Fluids*.

Low settling rates are observed for small particulate matter in strongly, stably stratified fluid. As the particle passes through an interface between two layers of fluid, it entrains lighter, upper fluid. The significance of this entrained fluid in the low Reynolds regime, along with a model for the behavior of the particle, has not yet been fully explored. We present careful measurements performed in stratified corn syrup showing the effects of the enhanced drag due to entrained fluid on the sphere at low Reynolds. We develop a model from first principles on the hydrodynamics, which involves a strong coupling between the variable density fluid and moving solid boundary. (Received September 16, 2008)