Relaxation of Large-Scale Fluctuations in a Well-Stirred Suspension JONATHAN H.C. LUKE, Department of Mathematical Sciences and Center for Applied Mathematics and Statistics, New Jersey Institute of Technology — Long-wavelength density fluctuations in a well-stirred suspension under the influence of gravity induce velocity fluctuations with a magnitude proportional to the linear dimensions of the container. The resulting flow suppresses the density fluctuations and results in a relaxation of the well-stirred suspension to a weakly stratified state with relatively small velocity fluctuations. This process is modelled as Stokes flow of an incompressible, highly viscous fluid with a variable density; the initial density is a realization of a random Gaussian field. The relaxation process is examined through theoretical analysis and numerical simulation. Results concerning the degree of stratification and the decay of the various Fourier components of the flow are presented.

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