

Abstract Submitted
for the DFD05 Meeting of
The American Physical Society

Decay of large scale fluctuations in sedimenting suspensions

JONATHAN LUKE, New Jersey Institute of Technology — For sufficiently short times and on sufficiently large length scales, the initial dynamics of a sedimenting suspension are that of a viscous fluid of variable density. For an initially well-stirred suspension, the variations in the density produce velocity fluctuations with a variance proportional to the container diameter. These fluctuations become vanishing small as time increases. The dynamics are quadratic and have features including an infinite collection of constants of the motion, a monotonically decreasing energy functional and a linear manifold of stationary solutions with a linear submanifold of stable stationary states. The implications of these features for quantifying the decay of velocity fluctuations are discussed. In particular, the transient phenomenon of fluctuation enhanced sedimentation is characterized.

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Date submitted: 12 Aug 2005

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