Abstract Submitted for the SHOCK07 Meeting of The American Physical Society

Simulation of the Richtmyer-Meshkov and Rayleigh-Taylor Instability Using Atomistic Methods¹ KAI KADAU, JOHN L. BARBER, TIM-OTHY C. GERMANN, PETER S. LOMDAHL, BRAD LEE HOLIAN, LANL, BERNI J. ALDER, LLNL — We present large-scale atomistic simulations [molecular dynamics (MD) and direct simulation Monte-Carlo (DSMC)] of fluid instabilities that occur when a fluid interface is subjected to shock loading or gravitation [Richtmyer-Meshkov and Rayleigh-Taylor instability]. The atomistic methods reach the parameter range that is of importance for inertial confinement fusion (ICF) capsules subjected to high energy lasers. The results are compared to existing theoretical and experimental work from which we have strong evidence for the importance of fluctuations in such instabilities. References: 1.) Kai Kadau, Timothy C. Germann , Nicolas G. Hadjiconstantinou , Peter S. Lomdahl *, Guy Dimonte , Brad Lee Holian *, and Berni J. Alder, PNAS 101, 5851 (2004). 2.)K. Kadau et al. submitted (2007).

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