

Abstract Submitted
for the DAMOP12 Meeting of
The American Physical Society

Dynamics of matter waves in tailored optical and atomic lattices JEREMY REEVES, BRYCE GADWAY, LUDWIG KRINNER, DANIEL PERTOT¹, MATTHIAS VOGT², DOMINIK SCHNEBLE, Department of Physics and Astronomy, Stony Brook University — We report experimental results on the dynamics of atomic matter waves in temporally and spatially modulated lattices. In a first experiment, we investigated the effects of disorder on dynamical localization in a periodically-pulsed optical lattice in the framework of a kicked-rotor model. A second experiment explored the interplay between disorder and interactions in the damping of Bloch oscillations in a tilted disordered lattice. In a third experiment, we examined the diffraction of atomic matter waves from 1D “crystal” arrays of lattice-trapped atoms with respect to the temporal dynamics of matter-wave scattering. We also demonstrated the use of matter waves to detect forced antiferromagnetic ordering in an atomic spin-mixture.

¹Currently at Cavendish Laboratory, Univ. of Cambridge

²Currently at Dept. Physics and Astronomy, Univ. of Würzburg

Jeremy Reeves
Department of Physics and Astronomy, Stony Brook University

Date submitted: 27 Jan 2012

Electronic form version 1.4