Abstract Submitted
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Damping Rates for Bloch Oscillations of Cold Atoms in Optical Lattices[1] T. BERGEMAN, Stony Brrok University — Reeves *et al* [1] have obtained experimental results on cold atoms in incommensurate optical lattices showing that the damping processes for Bloch oscillations from mean field effects and from disorder may counteract each other. Screening effects of disorder by mean field effects had been discussed also theoretically [2,3]. Ref. [2] posits a general mechanism based on certain approximations, but it is not always clear over what range these approximations are valid and how they might be extended. By numerical calculations based on the time-dependent Gross-Pitaevskii equation, I survey such damping effects as a function of the amplitudes of the mean field and of a "disorder" potential from a second noncommensurate lattice, as in [1]. One question of interest is the following: for a given arbitrary value of the disorder potential, as a function of atom density or atom-atom interaction, where is the mimimum in the damping of the Bloch oscillations?

[1] J. Reeves, M. Vogt, B. Gadway, D. Pertot and D. Schneble, BAPS **57**, 76 (2012).
[2] T. Schulte et al., Phys, Rev, A **77**, 923619 (2008).
[3] S. Walter et al., Phys. Rev. A **81**, 033623 (2010).

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