Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

**Synthesizing 1D Dirac dispersion and unidirectional spin flow for cold atoms** MINGWU LU, DINA GENKINA, ALINA PINEIRO, I.B. SPIELMAN, Joint Quantum Institute, Univ. of Maryland, College Park and National Institute of Standards and Technology — We describe a spin dependent bipartite [1] Floquet lattice [2], in which the dispersion relation is linear for all points in the Brillouin zone. The Floquet spectrum of our periodically-driven Hamiltonian features: perfect spin-momentum locking, a linear Dirac dispersion, and unidirectional spin-motion. These experiments are performed in $87Rb$ Bose-Einstein condensates subject to simultaneous RF and Optical couplings. [1] H.-I Lu, M. Schemmer, L. Aycock, D. Genkina, S. Sugawa, and I. Spielman, Phys Rev Lett 116, 200402 (2016) [2] J.C. Budich, Y Hu, P. Zoller, Phys Rev Lett 118, 105302 (2017)

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Date submitted: 07 Feb 2018 Electronic form version 1.4