

Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Topological Bose-Mott Insulators in a One-Dimensional Optical Superlattice¹ SHI-LIANG ZHU, Nanjing University, Z.D. WANG, The University of Hong Kong, Y.H. CHAN, L.M. DUAN, Michigan University — In this talk, I will introduce topological Bose-Mott insulators we found in a one-dimensional optical superlattice. We study topological properties of the Bose-Hubbard model with repulsive interactions in a one-dimensional optical superlattice, and find that the Mott insulator states of the single-component (two-component) Bose-Hubbard model under fractional fillings are topological insulators characterized by a nonzero charge (or spin) Chern number with nontrivial edge states. For ultracold atomic experiments, we show that the topological Chern number can be detected through measuring the density profiles of the bosonic atoms in a harmonic trap. Ref.: S.L. Zhu, Z.D. Wang, Y.H. Chan, and L.M. Duan, Phys. Rev. Lett. 110, 075303 (2013).

¹Zhu was supported by NSFC, SKPBR of China and PCSIRT.

Shi-Liang Zhu
Nanjing University

Date submitted: 12 Nov 2013

Electronic form version 1.4