

Abstract Submitted  
for the DAMOP16 Meeting of  
The American Physical Society

**Detecting Topological Phases in Ultracold Atomic Gases with Strong Interactions** DONG-LING DENG, Condensed Matter Theory Center and Joint Quantum Institute, Department of Physics, University of Maryland, College Park, MD 20742-4111, USA, SHENG-TAO WANG, KAI SUN, L.-M. DUAN, Department of Physics, University of Michigan, Ann Arbor, Michigan 48109, USA — We propose a generic scheme to unambiguously probe topological invariants in ultracold-atomic systems using momentum-resolved Raman or radio-frequency spectroscopy. The method is based on Green's function formulations and is applicable to a wide range of topological states in arbitrary spatial dimensions with or without strong interactions. Using an interacting one-dimensional topological insulator as an example, we further demonstrate that the scheme is robust against realistic experimental imperfections, such as the inhomogeneous trapping potential and limited experimental resolution.

Condensed Matter Theory Center and Joint Quantum Institute, Department of Physics, University of Maryland

Date submitted: 29 Jan 2016

Electronic form version 1.4