

Abstract Submitted
for the DAMOP16 Meeting of
The American Physical Society

Exploration of scattering resonances in the presence of Rashba-Dresselhaus spin-orbit coupling SU-JU WANG, CHRIS GREENE, Department of Physics and Astronomy, Purdue University — Engineering dispersion relations of the center-of-mass motion of cold atoms using lasers allows quantum simulations and the study of some exotic physics. The recent experimental realizations of equal Rashba and Dresselhaus spin-orbit coupling (E-RDSOC) in both ultracold bosonic and fermionic atoms enable ultracold atomic systems to display SOC physics. Spin-orbit coupling often exhibits a double-minimum energy-momentum dispersion. The two-body scattering threshold in the E-RDSOC scheme is found to be determined by the ratio of the SOC strength and the Raman coupling strength. When the critical SOC strength is met, the energy dispersion changes from a single-minimum structure to a double-minimum structure. Possible scattering resonances associated with bound states in the closed channels are explored in the double-minimum region.

Su-Ju Wang
Department of Physics and Astronomy, Purdue University

Date submitted: 28 Jan 2016

Electronic form version 1.4