Experiments with Raman dressed BECs and Floquet Bloch systems

Peter Engels*[1]

[1]Washington State University (WSU) – Department of Physics and Astronomy PO Box 642814 Pullman, WA 99164, United States

Abstract

The investigation and quantum emulation of spin-orbit coupling is currently drawing considerable interest. Spin-orbit coupling is a crucial ingredient for many phenomena from modern solid state physics, such as topological insulator physics, topological superconductivity, spin Hall effects, etc. Synthesizing spin-orbit coupling in degenerate quantum gases provides a powerful platform for the investigation of such exotic physics due to the unprecedented tunability of ultracold atom systems.
Recently, Raman dressing as well as periodic lattice modulation have emerged as powerful tools to create interesting dispersion relations and to effect spin-orbit coupling. In this talk I will report on our experiments at WSU investigating the consequences of modified dispersions in Raman-dressed BECs, Raman dressed lattice systems, and hybrid s-p Floquet-Bloch lattices.

*Speaker