## Abstract Submitted for the CUWIP21 Meeting of The American Physical Society

## Quantum Control of Magnetic Phase Boundaries in Spin-2 BECs<sup>1</sup>

MARIA BELOTA MORENO, DAVID HALL, Amherst College — The types of topological excitations supported by a spin-2 Bose-Einstein Condensate (BEC) are determined by a symmetry of the order parameter called the magnetic phase. Experiments involving topological excitations crossing a magnetic phase boundary are of interest because they provide insight on what happens to the excitation when it moves into a medium where its type is not supported i.e. does it disappear, transform into a different type of excitation that is supported, or do something else entirely? To answer these questions, we first experimentally construct these types of boundaries. To do so, we create a phase boundary with spin-1 BECs that have only one populated spinor component. Then, we use microwave pulses to map this boundary onto spin-2 BECs with up to three populated spinor components. This project aims to demonstrate full quantum control of the magnetic phases created in the spin-2 BECs through these mappings. Using radiofrequency pulses, we have demonstrated experimental control for the mappings onto spin-2 BECs with two nonzero spinor components.

<sup>1</sup>NSF Grant PHY-1806318

Maria Belota Moreno Amherst College

Date submitted: 04 Jan 2021 Electronic form version 1.4