

Abstract Submitted
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Magnetic phases of spin-1 spin-orbit coupled Bose gases¹ DANIEL CAMPBELL, RYAN PRICE, ANDIKA PUTRA, ANA VALDÉS-CURIEL, DIMITRIOS TRYPOGEOGOS, IAN SPIELMAN, Joint Quantum Institute, University of Maryland, College Park, Maryland, 20742, USA, SPIELMAN TEAM — We experimentally explore the magnetic phases present in a near-zero temperature spin-1 spin-orbit coupled atomic Bose gas. We observe ferromagnetic and unpolarized phases which are stabilized by the spin-orbit couplings explicit locking between spin and motion. In the limit of weak spin-orbit coupling, these phases are separated by a critical curve of 1st order quantum phase transitions, with an observed width as small as $h \times 4Hz$. These phase transitions give rise to long-lived metastable states.

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