Interferometry and Gravimetry with Spin-Orbit Coupled Condensates\textsuperscript{1} BRANDON ANDERSON, VICTOR GALITSKI, University of Maryland at College Park — We propose an implementation of an atom interferometer using a system of Bosons with an optically induced pseudo-spin-1/2 degree of freedom. The localized pseudo-spin degree of freedom allows for a trapped condensate to experience interference effects without the need for a system to travel large spatial path lengths. It is shown that a spatially varying Zeeman field will induce an energy splitting between the degrees of freedom that is dependent on gravity and the acceleration of the system. The effects of the many-body ground state are explored and a general procedure for observing inertial effects is given.

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