

Abstract Submitted  
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**Search for long-range spin-mass forces** JUNYI LEE, ATTAALLAH ALMASI, MICHAEL ROMALIS, Princeton University — We report on the progress in the search for anomalous spin-mass interactions that can be mediated by light particles, for example axion-like particles, which are also potential candidates for dark matter. In this experiment, we measure energy shifts of spin polarized atoms in a  $^3\text{He-K}$  co-magnetometer as the positions of two nearby 200 kg unpolarized source masses are modulated. Bounds on possible anomalous spin-mass interactions can be extracted from correlations in these measurements. The sensitivity of the co-magnetometer should allow us to exceed for the first time the astrophysical limits on spin-dependent forces. Various systematic effects due to the motion and positions of the weights have also been studied and quantified. Supported by NSF PHY-1404325.

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