

Abstract Submitted  
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**Nuclear Magnetic Dipole Frequency Shifts in a  $^3\text{He}$ - $^{129}\text{Xe}$  Comagnetometer** MARK LIMES, NEZIH DURAL, MICHAEL ROMALIS, Princeton Univ, ELIZABETH FOLEY, TOM KORNACK, Twinleaf LLC — We report on the operation of a  $^3\text{He}$ - $^{129}\text{Xe}$  comagnetometer in 2-mm sized anodically bonded cells with a 300 s spin coherence time for  $^{129}\text{Xe}$ . We use a series of batch-fabricated cells with well-defined cylindrical geometries to measure the frequency shifts due to nuclear magnetic dipole fields. We find that these frequency shifts, which cause instabilities in the operation of vapor-cell comagnetometers, can be nulled out in certain geometries. Using this control we investigate the isotropic spin-spin coupling between the two noble-gas nuclei.

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