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Progress toward an interferometer with $\mathbf{T}^3$*sensitivityscaling*[1] J. G. LEE, Naval Postgraduate School, Dept. of Physics, Monterey, CA, M. ZIMMERMANN, M. A. EFREMOV, W. P. SCHLEICH, Ulm University, Ulm, Germany, F. A. NARDUCCI, Naval Postgraduate School, Dept. of Physics, Monterey, CA — An atom interferometer in which the two internal states experience differing accelerations has a phase that scales as the cube of the time during which the atoms experience the acceleration. This increase in scaling over the quadratic scaling of a standard interferometer can potentially lead to higher sensitivity to acceleration. This system can be realized experimentally by using magnetically sensitive sublevels of rubidium 85 as the states for the interferometer and applying a linear magnetic field gradient along the ballistic path of the atoms. We present our progress on rebuilding an apparatus to study this idea in a new lab space, including measurements of Raman transitions and Ramsey interference, as well as discussion of the technical challenges encountered and their solutions.

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Jeffrey Lee
Naval Postgraduate School, Dept. of Physics, Monterey, CA

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