

Abstract Submitted  
for the DAMOP18 Meeting of  
The American Physical Society

**Demonstration of a Sensitive Method to Measure Nuclear Spin-Dependent Parity Violation** EMINE ALTUNTAS<sup>1</sup>, Yale University, JEFFREY AMMON, Lincoln Laboratory, MIT, SIDNEY CAHN, DAVID DEMILLE, Yale University — Nuclear spin-dependent parity violation (NSD-PV) effects arise from exchange of the  $Z^0$  boson between electrons and the nucleus, and from interaction of electrons with the nuclear anapole moment, a parity-odd magnetic moment. We are studying NSD-PV effects using diatomic molecules, where the signal is dramatically amplified by bringing rotational levels of opposite parity close to degeneracy in a strong magnetic field. The NSD-PV interaction matrix element is measured using a Stark-interference technique. We present results that demonstrate sensitivity to NSD-PV surpassing that of any previous atomic PV measurement, using the test system  $^{138}\text{Ba}^{19}\text{F}$ . We describe the concept of our experiment, our data, sources of uncertainty, and prospects of using this technique to measure aspects of the electroweak interaction that have prove difficult to determine with other methods.

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Date submitted: 26 Jan 2018

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