

Abstract Submitted
for the DNP17 Meeting of
The American Physical Society

Increasing The Electric Field For An Improved Search For Time-Reversal Violation Using Radium-225¹ ADAM POWERS, Michigan State University, East Lansing — Radium-225 atoms, because of their unusual pear-shaped nuclei, have an enhanced sensitivity to the violation of time reversal symmetry. A breakdown of this fundamental symmetry could help explain the apparent scarcity of antimatter in the Universe. Our goal is to improve the statistical sensitivity of an ongoing experiment that precisely measures the EDM of Radium-225. This can be done by increasing the electric field acting on the Radium atoms. We do this by increasing the voltage that can be reliably applied between two electrodes, and narrowing the gap between them. We use a varying high voltage system to condition the electrodes using incremental voltage ramp tests to achieve higher voltage potential differences. Using an adjustable gap mount to change the distance between the electrodes, specific metals for their composition, and a clean room procedure to keep particulates out of the system, we produce a higher and more stable electric field. Progress is marked by measurements of the leakage current between the electrodes during our incremental voltage ramp tests or emulated tests of the actual experiment, with low and constant current showing stability of the field.

¹This project is supported by Michigan State University, and the US DOE, Office of Science, Office of Nuclear Physics, under contract DE-AC02-06CH11357.

Adam Powers
Michigan State University, East Lansing

Date submitted: 02 Aug 2017

Electronic form version 1.4