

Abstract Submitted
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First Measurement of the Permanent Electric Dipole Moment of Radium-225¹ JAIDEEP T. SINGH, NSCL/MSU, K.G. BAILEY, M.N. BISHOP, Argonne National Lab, M.R. DIETRICH, Northwestern University, Argonne National Lab, J.P. GREENE, R.J. HOLT, Argonne National Lab, M.R. KALITA, W. KORSCH, University of Kentucky, N.D. LEMKE, Argonne National Lab, Z.-T. LU, Argonne National Lab, University of Chicago, P. MUELLER, T.P. O'CONNOR, Argonne National Lab, R.H. PARKER, University of Chicago, Argonne National Lab — Electric dipole moments (EDMs) are signatures of time-reversal (T), parity (P), & charge-parity (CP) violation. CP -violation beyond the Standard Model is generally believed to be required to explain the observed prevalence of matter over antimatter in the universe. Radium-225 ($\tau_{1/2} = 14.7$ d, $I = 1/2$) is mostly sensitive to T - and P -violating interactions originating within the nucleus. The best limits on these types of exotic interactions are derived from the atomic EDM limit for Mercury-199. Because of its unusual nuclear structure (octupole deformation), Ra-225 is expected to have a physics sensitivity that is a few hundred to a few thousand times higher than Hg-199. Laser cooling & trapping techniques are performed to collect & transport the cold Ra atoms into the measurement region. An EDM measurement is then performed by searching for a linear electric field dependent shift in the nuclear spin precession frequency of Ra-225. We will report on the first measurement of the atomic EDM of Ra-225 as well as plans for future improvements.

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