Abstract Submitted
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Laser trapping of Radium and progress towards an electric dipole moment measurement[1] J.R. GUEST, N. D. SCIELZO, I. AHMAD, K. BAILEY, J. P. GREENE, R. J. HOLT, Z.-T. LU, T. P. O'CONNOR, D. H. POTTERVELD, Physics Division, Argonne National Laboratory, H. GOULD, Lawrence Berkeley National Laboratory — Permanent electric dipole moments (EDMs) in atoms or molecules are signatures of Time (T)-and Parity (P)-violation and represent an important window onto physics beyond the Standard Model. We are developing a next generation EDM search around laser-cooled and trapped Ra-225. Due to octupole deformation of the nucleus, Ra-225 is predicted to be two to three orders of magnitude more sensitive to T-violating interactions than Hg-199, which currently sets the most stringent limits in the nuclear sector. We will discuss our progress, including the successful laser cooling and trapping of Ra-226 atoms. Using the $^1S_0$ F=0 – $^3P_1$ F=1 transition, we have demonstrated transverse cooling, Zeeman slowing, and capture of Ra-226 atoms in a magneto-optical trap (MOT). By repumping the $^3D_1$ dark state to the $^1P_1$ state, which decays back to ground $^1S_0$ state, we have extended the lifetime of the trap from milliseconds to seconds.

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