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Upgrades for an improved measurement of the EDM of ^{225}Ra
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T. SINGH, Michigan State University — If charge conjugation (C), parity (P) and
time-reversal (T) symmetries, collectively form a good symmetry of nature, CPT,
then T-violating phenomena would also violate CP. An Electric Dipole Moment
(EDM) would violate time-reversal symmetry, and therefore EDMs provide a sensi-
tive way for probing CP-violation that might explain the abundance of matter over
anti-matter in the Universe. The ^{225}Ra atom ($t_{1/2} = 15$ days, $I = 1/2$) is a par-
ticularly attractive candidate for an EDM search in diamagnetic atoms due to its
octupole deformed nuclear structure, nearly degenerate parity doublet ground state,
and a large mass, that make it sensitive to T-violating interactions in the nuclear
sector. Our latest measurement limits the atomic EDM of ^{225}Ra to be less than
 1.4×10^{-23} e-cm (95% C.L). Further experimental upgrades are being implemented
including an electric field upgrade to enhance the EDM sensitivity and STIRAP for
an improved spin precession detection scheme. With these upgrades in place our
EDM sensitivity should increase by nearly two orders of magnitude and allow us
to substantially improve constraints on certain T-violating processes within the nu-
cleus. This work is supported by the U.S. DOE, Office of Science, Office of Nuclear
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