Abstract Submitted
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Prospects for electric-dipole-moment measurements in radon TIMOTHY CHUPP, University of Michigan, RADONEDM COLLABORATION[1] — A permanent electric dipole moment (EDM) of a particle or system would arise due to breaking of time-reversal, or equivalently CP symmetry. Experiments to date on the neutron, atoms and molecules have only set upper limits on EDMs. New techniques and systems in which the effects of CP violation would be greatly enhanced are driving the field forward. Systems that may be favorable for significant advances include ^{221,223}Rn, where the combination of octupole collectivity and relatively closely spaced opposite parity levels would increase the nuclear Schiff moment by one or more orders of magnitude compared to other diamagnetic atoms, i.e. ^{199}Hg. We have developed and tested at TRIUMF-ISAC an on-line EDM experiment that will collect and make measurements on the short-lived species ($T_{1/2} \approx 25$ m) featuring high-efficiency collection and spin-exchange polarization of noble-gas isotopes. Nuclear-structure issues include determining the octupole collectivity as well as the spacing of opposite parity levels. Experiments are underway at ISOLDE, NSCL and ISAC to study the nuclear structure of isotopes in this mass region. I will report on progress and comment on how we learn about the basic physical parameters of CP violation from EDM measurements.

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