Prospects for electric-dipole-moment measurements in radon
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— 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 signifi-
cant advances include $^{221,223}$Rn, where the combination of octupole collectivity and
relatively closely spaced opposite parity levels would increase the nuclear Schiff mo-
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 experi-
ment 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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