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Possible Search for the Electric Dipole Moment of the Electron in an Electrostatic Storage Ring DAVID KAWALL, University of Massachusetts Amherst — A non-zero permanent electric dipole moment (EDM) of an electron would violate parity and time-reversal symmetries. Non-zero EDMs are predicted in the Standard Model, but are unobservably small. New physics incorporating new particles and new CP-violating phases can lead, through radiative corrections, to dramatic enhancements of the electron EDM, to within a few orders of magnitude of the current experimental limit, $|d_e| < 1.0 \times 10^{-27}$ e cm. A possible new approach to electron EDM searches using molecular ions stored in a table-top electrostatic storage ring is described. Molecular ions with long-lived paramagnetic states such as WN^+ could be injected and stored in large numbers and with long coherence times. Sensitivities approaching a few $\times 10^{-30}$ e cm/$\sqrt{\text{day}}$, appear possible, a potential improvement by three orders of magnitude.

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