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CP-violating Moments in Few-body Systems

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The existence of a permanent electric dipole moment (EDM) would reflect direct violation of time-reversal (T) and parity (P), and thus CP-violation through the CPT theorem. Several experimental programs are pushing the limits on EDMs in the neutron, nuclei, and atoms. There are two mechanisms for P,T-violation in the nucleus; one driven by P,T-violation in the individual nucleons, and a second by a P,T-violating nucleon-nucleon (N-N) interaction. Searches for EDMs in neutral atoms are sensitive the CP-violation in the nucleus only through the screened Schiff moment. The latter is suppressed in light nuclei and enhanced in some heavy nuclei, rendering light nuclei unsuitable for this class of experiments. However, a new scheme for measuring EDMS of stripped nuclei in a magnetic storage ring suggests that few-body nuclei could be used to set accurate limits on the CP-violation N-N interaction. In this talk, I review the situation in few-body versus many-body systems, and examine the physics determining the different CP-violating moments in nuclei.