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EDM Searches in Muons and Deuterons J.A. MILLER, STORAGE RING EDM COLLABORATION — The observation of a permanent electric dipole moment aligned along the spin of an elementary particle is a violation of both parity (P) and time reversal (T) invariances. So far, no such observation has been made. T violation implies, under the assumption of CPT invariance, that there would be a corresponding violation of CP invariance. Because the properties of CP invariance play important roles in the unraveling of the mysteries of the Standard Model (SM) and in understanding the baryon asymmetry of the universe, much experimental effort has occurred or is planned to search for EDMs in a variety of atoms and elementary particles. Here, high precision searches of the EDMs of the muon and the deuteron will be discussed. The muon sensitivity will be at the level of 10^{-24} - 10^{-26} e-cm, which is largely limited by available muon fluxes. Models outside the SM predict an EDM as large as a few times 10^{-22} e-cm. The much larger available flux of deuterons can lead to a measurement at the 10^{-29} e-cm level, which would make it the best EDM limit on any particle. The proposed experiments would employ the thus far relatively unexploited technique of storage rings, which enables the measurement of the EDM of free charged particles to high precision for the first time. All experimental approaches measure the interaction of the putative EDM with a strong electric field. The proposed approach completely circumvents the 'Schiff suppression' of the EDM signal when particles are embedded inside neutral atoms.

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