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Nuclear Electric Dipole Moment of ³He I. STETCU, Los Alamos National Laboratory, C.-P. LIU, Univ. of Wisconsin, J. FRIAR, A. HAYES, Los Alamos National Laboratory, P. NAVRATIL, Lawrence Livermore National Laboratory — A permanent electric dipole moment (EDM) of a physical system requires time-reversal (T) and parity (P) violation. Experimental programs are currently pushing the limits on EDMs in atoms, nuclei, and the neutron to regimes of fundamental theoretical interest. Here we calculate the magnitude of the PT-violating EDM of 3He and the expected sensitivity of such a measurement to the underlying PT-violating interactions. Assuming that the coupling constants are of comparable magnitude for pi-, rho-, and omega-exchanges, we find that the pion-exchange contribution dominates. Our results suggest that a measurement of the 3He EDM is complementary to the planned neutron and deuteron experiments, and could provide a powerful constraint for the theoretical models of the pion-nucleon PT-violating interaction.

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