

Neutron Electric Dipole Moment Searches

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Since several decades people search for the electric dipole moment (EDM) of the neutron, an unambiguous manifestation of parity (P) and time reversal symmetry (T) violation. Assuming the conservation of CPT, T violation in a fundamental system also means CP violation. This has only been observed in very few systems in the Standard Model of particle physics (SM) as a tiny effect. However, it would be needed in much larger quantities to help explain the matter-antimatter asymmetry in the Universe. With a long history of innovation and persistence, the neutron EDM d_n is now limited to below $3 \cdot 10^{-26}$ e-cm, an extraordinarily small number, corresponding to an energy resolution of 10-22 eV. As a complementary system among a variety of possible options, it is still a very promising candidate due to its comparably simple composition, needed to understand the underlying fundamental physical processes. In this talk I will discuss experimental efforts and challenges to develop a next generation of neutron EDM searches, with one focus on magnetic fields and their implications for other precision experiments.

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