

The neutron Electric Dipole Moment experiment (nEDM) - exploring the low-energy precision frontier

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The search for a permanent neutron electric dipole moment with ultracold neutrons (UCN) is one of the prominent experiments to test CP-violation at the low-energy precision frontier. Extensions to the SM can provide enough CP violation to accommodate for the observed baryon asymmetry of the universe, while at the same time predicting nEDM values in the range of 10^{-26} to 10^{-28} ecm. This is just below the present upper bound of $2.9 \cdot 10^{-26}$ ecm [1] which was limited mostly by counting statistics. An improved nEDM measurement is very timely and complements direct searches for new physics at the Large Hadron Collider. The nEDM Collaboration of 15 European institutes [2] prepares its first data taking phase at the high intensity superthermal UCN source at PSI [3] aiming to improve the nEDM sensitivity by a factor five within two years. The final goal of the collaboration is a factor 50 improvement with a newly designed instrument. Our research and development efforts with the present and future nEDM apparatus and connected systematics will be presented.

[1] C.A. Baker et al., Phys. Rev. Lett 97 (2006) 131801

[2] <http://nedm.web.psi.ch>

[3] <http://ucn.web.psi.ch>

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