

Challenges of the world-wide experimental search for the electric dipole moment of the neutron



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Search for a Neutron Electric Dipole Moment using a Pulsed Beam

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A novel concept to search for a CP-violating neutron electric dipole moment (nEDM) has been presented [F.M. Piegsa, Phys. Rev. C 88, 045502 (2013)]. It employs a pulsed neutron beam instead of the established use of storable ultracold neutrons (UCN). The technique takes advantage of the high peak flux and the time structure of a next-generation pulsed spallation source (e.g. the planned European Spallation Source) to directly measure the previously limiting systematic $v \times E$ -effect. Such an experiment would be complementary to experiments with UCN and could compete with their sensitivities on the 5×10^{-28} e cm level. In this talk, I will describe this alternative approach including possible systematic effects and first test experiments.

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