

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



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Crystal diffraction nEDM experiment. Present status and future progress.

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The proposed method to search for the neutron EDM is based on using a large crystal electric field affected the neutron in a crystal without center of symmetry during all the time of neutron stay in crystal.

Value of the field can reach about 10^9 V/cm and experimentally measured value for quartz crystal is $\sim 10^8$ V/cm.

The first variant of the experimental setup based on using a quartz crystal is now under construction.

The accuracy of this setup is expected on a level $\sim 210^{-26}$ e cm. The modern status of this project and possibility to improve the accuracy for different crystal without center of symmetry will be discussed. The “storage” variant of the setup will be considered. This variant allows essentially increase the time of neutron stay in crystal and therefore the method sensitivity can reach about 210^{-27} e cm for the BSO crystal.

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