

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



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A precise cesium vector magnetometer for the nEDM experiment

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We have developed a vector magnetometer based on optical pumping of cesium atoms to assess the magnetic field distribution in the neutron Electric Dipole Moment (nEDM) experiment at the Paul Scherrer Institute. The system measures deviations from homogeneous magnetic field conditions, which are an important source of systematic errors in nEDM. We will report on progress with a new magnetometer module, which, at 1 μT , has achieved a magnetic field precision of 75 fT in less than two seconds for scalar measurements, and 10 pT for transverse vector measurements, and 380 fT tesla for longitudinal vector measurements.

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