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The most stringent limit on the nEDM and future improvements at PSI

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As widely known, the discovery of an electric dipole moment (EDM) of the neutron would manifest the invariance time reversal and violate the combined symmetry of charge and parity (CP). At current experimental sensitivities an univocal signature of new physics, either induced by the QCD Theta-term or some beyond Standard Model mechanism.
I will present the most stringent limit on the neutron EDM,
|d_n |<1.8×10^(-26) ecm [4], from an experiment performed at the Paul Scherrer Institute by an international collaboration deploying Ramsey's method of separated oscillating magnetic fields on stored ultra cold neutrons. I will motivate and discuss the most salient feature of the experiment, a 199Hg co-magnetometer and an array of optically pumped cesium vapor magnetometers to cancel and correct for magnetic field changes.
In a second part, I will present the design of the new instrument, n2EDM, currently mounted at PSI, which will further increase the sensitivity to about 1×10^(-27) ecm [5].

References

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