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New limit of the permanent electric dipole moment of the neutron

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A nonzero permanent electric dipole moment (EDM) of a non-degenerate particle with spin implies the violation of time-reversal symmetry. Invoking the CPT theorem this also indicates the violation of the combined symmetry of charge conjugation and parity (CP). We present the result of an experiment to measure the EDM of the neutron at the Paul Scherrer Institute using Ramsey's method of separated oscillating magnetic fields with ultracold neutrons. Our measurement stands in the long history of EDM experiments probing physics violating time reversal invariance. The salient features of this experiment were the use of a ^{199}Hg co-magnetometer and an array of optically pumped cesium vapor magnetometers to cancel and correct for magnetic field changes. The statistical analysis was performed on blinded data sets by two separate groups while the estimation of systematic effects profited from an unprecedented knowledge of the magnetic field.