

An absolute, high-precision ^3He / Cs combined magnetometer

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Many experiments in fundamental science, such as the search for the neutron electric dipole moment (nEDM) at PSI, Switzerland, demand an accurate measurement and control of an applied magnetic field. Here, we describe a combined ^3He -Cs magnetometer for the absolute measurement of a μT magnetic field with a precision of better than 10^{-6} . The magnetometer detects the weak oscillating magnetic field produced by the precession of nuclear spin-polarized ^3He atoms with phase-feedback driven Cs magnetometers. We will report on measurements in the magnetically shielded room of PTB, Berlin, investigating the performance and intrinsic sensitivity of the combined device.

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