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Effects of magnetic field non-uniformities

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Magnetic field non-uniformities generate important systematic effects on the neutron EDM, especially for experiments using an atomic comagnetometer.

Field gradients generate frequency shifts of UCNs and atoms, possibly dependent on the electric field, they also induce transverse depolarization of UCNs.

All these effects will be reviewed.

I will first present a polynomial parametrization of the magnetic field adequate to describe such effects, generalizing the usual description in terms of linear gradients.

I will then report on a recent measurement of a false Hg EDM due to a cubic mode performed with the apparatus currently installed at PSI.

Finally the strategy to control the systematic effects due to field non-uniformities in the current PSI nEDM data will be presented.

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