

Systematic effects in searches for the electron EDM

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Experimental searches for permanent electric dipole moments (EDM) on a fundamental particle are predominantly executed in composed systems, such as neutrons, atoms or molecules. The experiments have reached a sensitivity which narrows the gap to the Standard Model predictions significantly which requires an improved understanding of the properties of composed systems in a particular experimental implementation. The NL-eEDM collaboration has built an experiment which employs a molecular beam of barium-monofluoride (BaF) [1]. We will discuss the measurement process of spin-precession in external electric and magnetic fields [2]. The method provides a path to the reduction of a systematic bias to an eEDM, in particular to the applied external electric field.

[1] P. Aggarwal et al., Measuring the electric dipole moment of the electron in BaF, Eur. Phys. J. D 72, 197 (2018)

[2] A. Boeschoten et al., Novel spin-precession method for sensitive EDM searches, arXiv:2303.06402 [physics.atom-ph], (2023)

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