

Search for permanent EDM using Fr atoms

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The existence of the permanent Electric Dipole Moment (EDM) implies the time reversal symmetry violation. This violation directly means CP violation by the CPT theorem, and it would be expected to explain the observed matter-antimatter asymmetry.

The T-violation predicted by the Standard Model (SM) of particle physics for the electron EDM is too small to be measured with current experimental technique and the larger EDM would indicate a new physics beyond SM. This tiny effect of EDM can be enhanced by the relativistic effects in the heavy atoms such as francium (Fr).

In this talk, we will see the overview of the experimental setup of the search for EDM using laser cooled 221-Fr atoms, produced from the alpha decay of 225-Ac, which can be used as the generator for 221-Fr, and has a long lifetime ~ 10 days.

The 221-Fr nucleus has a large octupole deformation effect and can become the candidate to search for the nuclear EDM. The new experimental apparatus to produce the high intensity 225-Ac source, and laser cooling for 221-Fr is now developing. The present status will be discussed.

Experimental nuclear physics

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Theoretical nuclear physics

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