

Trapping of francium-221 atoms for the measurement of the electron's electric dipole moment

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The electron's electric dipole moment (EDM) is a parameter that violates CP symmetry assuming the CPT invariance. Measuring the EDM provides constraints on the theories beyond the Standard Model of particle physics. Francium (Fr) is expected to exhibit the largest enhancement factor for the electron EDM among all alkali atoms. Because Fr has no stable isotope, we adopted Fr-221 produced via alpha-decay from actinium-225 (^{225}Ac) with a half-life of 9.9 days. For precise spectroscopic measurements, yttrium was deposited on the ^{225}Ac source by argon sputtering to slow down and neutralize the emitted Fr atoms. In this presentation, we will report the results of our recent experiment.

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