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【344】Measurement of multiple scattering of positrons for the Muon Electric Dipole Moment Experiment

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The limit on the muon electric dipole moment (muEDM) could be improved by $\sim 10^3$ with a dedicated muEDM Experiment at PSI. An EDM signal would be clear evidence of CP violation, while its absence at current sensitivity would constrain Beyond Standard Model theories. Simulations must incorporate multiple Coulomb scattering to determine its influence on design decisions. However, the underlying models at the relevant low momenta and material thicknesses require experimental verification. Multiple scattering of positrons and muons in graphite, pokalon and silicon was measured for momenta $50\,\mathrm{MeV}/c - 140\,\mathrm{MeV}/c$. The measurements validate these models to inform the reconstruction efficiency for positron trajectories, an important systematic uncertainty in measuring EDM-induced muon spin precession.

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