

Status and prospect of the J-PARC muon $g-2/EDM$ experiment

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The J-PARC muon $g-2/EDM$ experiment aims to measure the muon magnetic moment anomaly ($a = (g-2)/2$) and to search for the muon electric dipole moment, with sensitivity comparable to the highest in the world. This will be achieved using a small-emittance muon beam, created by cooling muons to thermal energy at room temperature and accelerating them with a multi-stage linac. The small emittance can eliminate the strong focusing requirements for muon storage and the beam-momentum constraints associated with focusing. As a result, we can adopt a compact storage magnet with excellent field uniformity and full-tracking capability for detecting decay positrons. The experimental approach significantly differs from the previous measurements conducted in BNL E821 and Fermilab E989. As seen in the recent theoretical advancements in studying a through various approaches, the J-PARC measurement will enhance our experimental understanding of a and its deviation from theoretical predictions. The experiment, planned to begin commissioning in 2028, is currently progressing with the development and implementation of experimental instruments and facility construction. Notably, the first-stage acceleration of cooled muons has been successfully demonstrated at J-PARC. This talk will present the current status and future prospects of the experiment.

Working Group

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