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The Electron g−2 as a Precision Test of the Standard Model and a Probe of New Physics

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The electron anomalous magnetic moment (g−2) provides one of the most stringent tests of quantum electrodynamics (QED), with both experiment and theory achieving sub-part-per-billion precision. This exceptional accuracy stems from the simplicity of the single-electron system and the small mass of the electron. Beyond testing QED, the electron g−2 is sensitive to possible contributions from physics beyond the Standard Model. Enhancing this sensitivity requires further advances in higher-order QED calculations and in the precision of key input parameters. This talk will discuss current challenges and prospects in this precision frontier.

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