Particle Physics Challenges



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Precise tests of the Standard Model with QED bound states.

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Measurements of lepton magnetic moments provide important tests of the Standard Model and may lead to an indirect discovery of new physics. In my talk, I will discuss bound electron g-factor and recent progress in the computation of the higher order corrections to the magnetic moment of an electron in hydrogen-like ions. I demonstrate a modern effective field theory approach to bound state QED and show how the state-of-the-art experiments, combined with precise theoretical predictions, lead to the most accurate determination of the fundamental constants. I will present prospects for future improvements and discuss the connection with the free electron and muon anomaly.

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