



Münchener Physik- Kolloquium

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First results from the Muon $g-2$ experiment at Fermilab

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At Fermi National Accelerator Laboratory, USA, the Muon $g-2$ collaboration is performing a new measurement of a_μ aiming at a fourfold improvement compared to the predecessor experiment at Brookhaven National Laboratory, USA. To extract the value of a_μ a clock comparison experiment is performed with spin-polarized muons confined in a superbly controlled electric and magnetic field environment. The deviation of the Larmor from the cyclotron frequency, the anomalous spin precession frequency, is determined while a high-precision measurement of the magnetic field environment is performed using nuclear magnetic resonance techniques. The first results from the new muon $g-2$ experiment provide an independent determination of a_μ to 460 ppb. The new world average value, with a decreased uncertainty of 350 ppb, exhibits a 4.2σ tension with the community approved Standard Model prediction. I will discuss the first result of the Muon $g-2$ experiment at FNAL in the context of current theoretical developments.

