

SES17-2017-000134

Abstract for an Invited Paper
for the SES17 Meeting of
the American Physical Society

The muon $g-2$ experiment: overview and prospects¹

DINKO POCANIC, University of Virginia

The muon gyromagnetic factor g_μ has long occupied a prominent place among the observables used in precision tests of the Standard Model (SM). The current discrepancy between the SM prediction and the value measured by the Brookhaven E821 Experiment stands at about 3.5 standard deviations, with comparable experimental and theoretical uncertainties. Two new experiments, one at Fermilab and the other at J-PARC, aim to improve the experimental uncertainty by a factor of 4. Meanwhile, the SM prediction is also expected to undergo a significant increase in precision. We review the status of the Fermilab experiment E989, currently operational and undergoing commissioning. E989 will analyze 21 times more muon decays than BNL E821, and is also poised to reduce the systematic uncertainty by a factor of 3. The overall goal of E989 is to achieve the precision of 0.14 ppm for $a_\mu = (g_\mu - 2)/2$.

¹Work supported by grants from the US NSF and DOE