

Abstract Submitted
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Search for New Physics with Experiment E36 at J-PARC¹

DONGWI DONGWI, Hampton University, TREK/E36 COLLABORATION — The E36 experiment conducted at J-PARC in Japan will provide a precision test of lepton universality in the $K_{e2}/K_{\mu2}$ ratio to search for new physics beyond the Standard Model (SM). The SM prediction for the ratio of leptonic K^+ decays is very precise with an uncertainty of $\Delta R_K/R_K = 4 \cdot 10^{-4}$. Any observed deviation from the SM prediction would break the universality of the lepton couplings and provide clear indication of New Physics beyond the SM. The detector apparatus allows sensitivity to search for light $U(1)$ gauge bosons and sterile neutrinos below $300 MeV/c^2$, which could be associated with dark matter or explain established muon-related anomalies such as the muon $g - 2$ value, and perhaps the proton radius puzzle. The experiment was set up at the J-PARC K1.1BR kaon beamline in the fall of 2014, fully commissioned in the spring of 2015 and completed production data accumulation in Dec 2015. A scintillating fiber target was used to stop a beam of up to 1.2 Million K^+ per spill. The K^+ products were detected with a large-acceptance toroidal spectrometer capable of tracking charged particles with high resolution, combined with a CsI(Tl) photon detector and particle ID systems. The status of the data analysis will be presented.

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