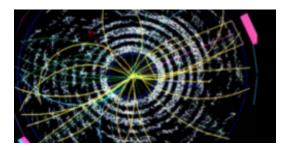
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New Physics Search with Experiment TREK/E36 at J-PARC

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We are potentially standing at the precipice in the quest for discovery of New Physics (NP) beyond the Standard Model (SM) by performing a precision test of lepton universality. Experiment E36 conducted at J- PARC in Japan is testing lepton universality in the RK = $\Gamma(\text{Ke2})/\Gamma(\text{K}\mu2)$ ratio. In the SM, the ratio of leptonic K+ decays is highly precise with an uncertainty of δRK /RK = $4 \cdot 10$ –4. Any observed deviation from the SM prediction would break the universality of the lepton couplings and provide a clear indication of NP beyond the SM. The E36 detector apparatus allows sensitivity to search for sterile neutrinos and light U(1) gauge bosons below 300 MeV/c2, 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. E36 data taking was completed in 2015. A scintillating fiber target was used to stop a beam of up to 1.2 Million K+ per spill. The K+ decay products were detected with a large-acceptance toroidal spectrometer capable of tracking charged particles with high resolution, combined with a CsI(Tl) photon calorimeter with large solid angle covering about 75% of 4π and particle identification systems. The status of the data analysis will be presented. This work has been supported by DOE Early Career Award DE-SC0003884 and DOE DE-SC0013941.

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