Abstract Submitted
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Probing New Physics with Experiment E36 at J-PARC[1] DONGWI H DONGWI, Hampton Univ, TREK COLLABORATION — The Standard Model (SM) has far reaching success in describing the building blocks of matter, nonetheless it is incomplete: falling short to explain dark matter, baryogenesis, neutrino masses and much more. Fueled by the LHCb measurements of $R(D)$ and $R(D^*)$ mesons, lepton non-universality has become the flagship for beyond SM searches. The TREK/E36 (E36) experiment conducted at J-PARC, Japan aims to test lepton universality in the $R_K = \Gamma(K_{e2})/\Gamma(K_{\mu 2})$ ratio, utilizing an active fiber target to stop a beam of up to 1.2 million K^+ per spill. K^+ decay products were detected with MWPCs and a large-acceptance toroidal spectrometer capable of analyzing charged particles with high resolution, combined with a CsI(Tl) photon calorimeter having a solid angle covering 75% of 4π and particle identification systems. Since the SM the ratio of leptonic K^+ decays is very precise, any observed deviation from the SM prediction would provide evidence of New Physics beyond the SM. Additionally, the E36 detector apparatus allows us 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 muon-related anomalies. The status of the data analysis will be presented.

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