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The TREK-E36 Search for New Physics at J-PARC (15' + 5')

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For the TREK Collaboration

The TREK-E36 experiment aims to provide a precision test of lepton universality in the leptonic decay ratio for positive kaons RK = Ke2/Kμ2 = Γ(K+->e+νe)/ Γ(K+->μ+νμ), to search for new physics beyond the Standard Model (SM) . The SM prediction for RK is very precise with an uncertainty of ΔRK/RK = 4 x 10-4. An observed deviation would be an indication of New Physics beyond the SM. The TREK-E36 apparatus consists of a toroidal spectrometer, that affords high resolution tracking, in concert with a kaon stopping target, a multi-element CsI(TI) photon detector, and particle ID detector array. TREK-E36 was installed in 2014, at the J-PARC K1.1BR kaon beamline. Commissioning was carried out in 2015 and production data taking was completed in the latter part of 2015. Because TREK-E36 employs stopped kaons, it will provide a unique cross-check to the CERN NA48/62 measurement, with considerably different systematics. The TREK-E36 data will also provide the opportunity to search for light bosons in the mass region below 300 MeV/c2, via rare decay of K+ in several decay channels. The light boson search would be in a mass region that is relevant for explanations of the muon anomalous magnetic moment (g-2) as well as the proton charge radius. This talk will go over the status of the data analysis.

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Presenter: KOHL, Michael (Hampton University)

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