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**Searching for Heavy Photons with TREK** PETER MONAGHAN,  
Hampton University — Experiment TREK/E36 at J-PARC to test lepton flavor universality and to search for new particles is expected to run in 2015. The possibility of a massive dark photon opens up new avenues of physics beyond the standard model. The motivation for the existence of photon-like gauge bosons can be seen in the observed positron excess in the universe, occurring via dark matter annihilation; through the muon anomalous magnetic moment, where theory and experiment disagree; through the proton radius puzzle, where the discrepancy between measurements of electronic and muonic hydrogen could be reconciled with a neutral gauge boson with selective coupling. This talk explores the opportunity to search for a neutral gauge boson in rare kaon decay channels. An in-depth look at a such a search with experiment E36 at the J-PARC facility in Japan will be presented.

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