Abstract Submitted
for the APR15 Meeting of
The American Physical Society

Status of the APEX experiment GREGG FRANKLIN, Carnegie Mellon University, ROUVEN ESSIG, Stoneybrook University, PHILIP SCHUSTER, NATALIA TORO, Perimeter Institute for Theoretical Physics, BOGDAN WOJTSEKHOWSKI, Thomas Jefferson National Laboratory Facility, APEX COLLABORATION — The A' EXperiment (APEX) will search for a new vector boson, A', with weak coupling $\alpha' \gtrsim 6 \times 10^{-8}\alpha$ to electrons ($\alpha = e^2/4\pi$) in the mass range 65 MeV $< m_{A'} <$ 550 MeV. New vector bosons with such small couplings arise naturally from a small kinetic mixing of the "dark photon" A' with the photon — one of the very few ways in which new forces can couple to the Standard Model — and have received considerable attention as an explanation of various dark matter related anomalies. A' bosons are produced by radiation off an electron beam, and could appear as narrow resonances with small production cross-section in the trident e^+e^- spectrum. We plan to search for the A' by using the CEBAF electron beam at energies of $\approx$ 1–4 GeV incident on $0.5 - 10\%$ radiation length multi-foil Tungsten targets, and measure the resulting e^+e^- pairs using the High Resolution Spectrometers and a septum magnet in Hall A at Jefferson Lab. With a 33-day run, the experiment will achieve very good sensitivity because the statistics of e^+e^- pairs will be $\sim 10,000$ times larger in the explored mass range than any previous search for the A' boson. This talk will discuss the experiment and present the results of a pilot run.

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Date submitted: 09 Jan 2015 Electronic form version 1.4