

# The Heavy Photon Search Experiment.

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## Abstract

In recent years much interest has been given to new physics models which have hidden sectors with extra massive U(1) gauge bosons, so-called heavy photons (or dark photons). Such theories could explain the dark matter problem and various anomalies in astrophysical observations. The Heavy Photon Search Experiment (HPS) at Jefferson Lab is a new experiment designed to look for these heavy photons in the mass range 20-1000 MeV that couple to electrons through kinematic mixing with couplings  $\alpha'/\alpha$  in the range  $10^{-5}$  to  $10^{-10}$ . The HPS will search for the  $e^+e^-$  or  $\mu^+\mu^-$  decay of the heavy photon, possibly with a detached vertex, using a compact forward spectrometer, which employs silicon microstrip detectors for vertexing and tracking, and a PbWO4 electromagnetic calorimeter for fast triggering. The design, performance, and results from the test run apparatus will be discussed, along with the collaborations plans for future construction and data taking.