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Heavy Photon Search Experiment

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The Heavy Photon Search Experiment (HPS) is a new experiment at Jefferson Lab designed to look for massive vector gauge bosons (heavy photons) in the mass range 20-1000 MeV that couple to electrons with couplings α/α in the range 10^{-5} to 10^{-10} . The experiment utilizes a compact forward spectrometer employing silicon microstrip detectors for vertexing and tracking and a PbWO₄ electromagnetic calorimeter for fast triggering, and is designed to measure the invariant mass and decay vertex location of electro-produced heavy photons. Following initial approval in January 2011, the HPS Collaboration has mounted the HPS Test Run Experiment, which ran parasitically in Hall B at JLAB during Spring 2012, and commissioned the tracker, ECal, high rate trigger, and DAQ, and succeeded in testing background assumptions for the full experiment. On the basis of this successful test run, the experiment has been approved for physics running. The design, performance, and results from the Test Run apparatus will be discussed, along with the collaboration's plans for future construction and data taking.

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