

Abstract Submitted
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Bump-Hunt Analysis on the 2016 Data of the Heavy Photon Search (HPS) Experiment SEBOUH PAUL, William Mary Coll, HEAVY PHOTON SEARCH COLLABORATION — Theoretical and phenomenological considerations motivate the existence of a massive gauge boson associated with a new, broken U(1) gauge symmetry. This particle, called a “heavy photon” (A'), would interact feebly with electrically charged particles in the Standard Model through kinetic mixing with the Standard Model photon, allowing it to be produced and detected in a laboratory setting. The Heavy Photon Search Experiment (HPS) at Jefferson Lab uses an electron beam striking a fixed tungsten foil target to attempt to produce A' s and detect their decay products, an e^+e^- pair. HPS consists of a silicon vertex tracker inside a dipole magnet and an electromagnetic calorimeter for triggering and electron identification. The A' signal would be a peak with the experimental resolution on top of a much larger QED background through both bump-hunting and a displaced vertex searches. HPS has had two successful preliminary runs at 1.05 GeV beam energy in 2015 and 2.3 GeV in 2016. Experimental setup, performance and future prospects will be summarized, while the focus of this talk will be on the bump-hunt analysis on the 2016 run.

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