

Abstract Submitted  
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**The Heavy Photon Search Experiment: Searching for Dark Photons at Jefferson Lab** OMAR MORENO, Santa Cruz Institute for Particle Physics, HEAVY PHOTON SEARCH COLLABORATION — The Heavy Photon Search (HPS) is new experiment at Jefferson Lab (JLab), which will search for massive vector gauge bosons (heavy/dark photons) in the mass range of 20-1000 MeV/ $c^2$ . These dark photons are expected on very general theoretical grounds and are motivated by recent astrophysical evidence suggesting they may mediate dark matter annihilations and/or interactions with ordinary matter. The dark photon couples to the ordinary photon through kinetic mixing which induces their weak coupling to electrons. This allows for dark photon production through a process analogous to bremsstrahlung radiation. If the coupling is large enough, the subsequent decay to  $e^+e^-$  will produce a narrow peak in the  $e^+e^-$  mass spectrum which can be observed above the dominant QED trident background. If the coupling is small enough, then the dark photons will travel detectable distances before decaying, providing a second signature. Using JLab's high luminosity electron beam along with a compact large acceptance forward spectrometer, silicon vertex tracker, PbWO<sub>4</sub> electromagnetic calorimeter and a muon detector, HPS will explore a large domain in the mass/coupling plane with extraordinary sensitivity. In this talk, I will discuss the status of the HPS experiment.

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