

Abstract Submitted
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The Heavy Photon Search Experiment at Jefferson Lab
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COLLABORATION — New heavy vector bosons, also known as “heavy photons”,
“dark photons”, or “hidden sector photons”, are expected on very general theo-
retical grounds. Recent astrophysical evidence motivates the direct search for a
heavy photon A' in the mass range $m_{A'} \sim 20$ to 1000 MeV/ c^2 , with coupling to
ordinary photons *via* a kinetic mixing term $\propto \epsilon$, expected around 10^{-5} to 10^{-2} .
Such a new dark force gauge boson below the GeV range would naturally mediate
TeV range dark matter annihilation, and interaction with ordinary matter. Existing
constraints from collider searches and beam dump experiments leave much of this
preferred $(m_{A'}, \epsilon)$ phase space unexplored. The detection of electroproduced A' on
a heavy target from their decay into e^+e^- pairs comes with a copious QED trident
background. Using the high luminosity and precision beam available from Jlab, and
combining a silicon microstrip vertex tracker with a lead-tungstate calorimeter for
triggering, the HPS experiment will hunt for the A' in a large ϵ range, with unique
sensitivity in the lower coupling range using vertexing to suppress the trident back-
ground. In this talk, the experimental setup and goals of the HPS experiment will
be presented.

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