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Resonance search results from HPS and Future Prospects MATHEW GRAHAM, SLAC National Accelerator Laboratory, HPS COLLABORATION — The Heavy Photon Search (HPS) experiment at Jefferson Lab is searching for a new U(1) vector boson ("heavy photon","dark photon" or A$'$) in the mass range of 20-200 MeV/c^2. An A$'$ in this mass range is theoretically favorable and may mediate dark matter interactions. In these models, the A$'$ couples to the ordinary photon through kinetic mixing, which induces its coupling to electric charge. Since heavy photons couple to electrons, they can be produced through a process analogous to bremsstrahlung, subsequently decaying to an e+e pair which can be observed as a narrow resonance above the dominant QED trident background. Using the CEBAF electron beam at Jefferson Lab incident on a thin tungsten target along with a compact, large acceptance forward spectrometer consisting of a silicon vertex tracker and lead tungstate electromagnetic calorimeter, HPS is accessing unexplored regions in the mass-coupling parameter space. The HPS engineering run took place in spring of 2015 using a 1.056 GeV, 50 nA beam and collected 1165 nb^1 (7.29 mC) of data. This talk will present the first results of a resonance search for a heavy photon and prospects for future searches and detector upgrades.

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