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Dark photon search

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The Heavy Photon Search (HPS) experiment searches for an electro-produced dark photon using an electron beam provided by the CEBAF accelerator at the Thomas Jefferson National Accelerator Facility.

HPS looks for dark photons through two distinct methods, a resonance search in the $e+e-$ invariant mass distribution above the large QED background (large dark photon-SM particles coupling region) and a displaced vertex search for long-lived dark photons (small coupling region).

HPS employs a compact spectrometer, matched to the forward kinematic characteristics of A' electro-production. The detector consists of a silicon tracker for momentum analysis and vertexing and a lead tungstate ($PbWO_4$) electromagnetic calorimeter for particle ID and triggering.

Three taking periods took place in 2015, 2016 and 2019, while a fourth run has been scheduled in summer 2021.

Results from the available data are presented together with an overview of future projects.

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