

The APEX Experiment at Jefferson Lab: A Search for a New Vector Boson

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The A' Experiment, or APEX, aims to search for a new vector boson that kinetically mixes with the photon, a “dark photon” or a “heavy photon”, with a mass of $\mathcal{O}(100 \text{ MeV})$ by studying the invariant mass spectrum of e^+e^- pairs produced from an electron beam on a high-Z target. Dark photons appear in many well-motivated extensions of the Standard Model and may mediate interactions between dark matter and ordinary matter. APEX will extend current constraints on the mixing parameter by a factor of a few for dark photon masses near 100 MeV. APEX is scheduled to take data at Jefferson Lab in early 2019, taking advantage of the high duty-factor electron beam and using the twin symmetric high resolution spectrometers in Hall A. An overview of the current constraints for such a boson and experimental plans will be presented.

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Collaboration name

APEX Collaboration

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