

Development of Novel Germanium Detectors in Searching for Dark Photons

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We present the calculations of using advanced germanium (Ge) detectors to search for dark photons in terms of absorption and conversion to electrons. A Ge detector utilizing internal charge amplification for the charge carriers created by the ionization of impurities is a novel technology with experimental sensitivity for detecting dark photons. We calculate the sensitivity of such a Ge experiment for detecting dark photons in the low-energy region and discuss our effort to fabricate such a detector in our lab that realizes Ge internal charge amplification (GeICA). We show that, if GeICA technology becomes available, then a new opportunity arises to observe dark photons.

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