

Abstract Submitted
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Experimental limits on dark photon models from HAYSTAC

SUMITA GHOSH, Yale University — Dark matter has traditionally been modeled as a single particle. However, the visible matter making up $\sim 15\%$ of the matter density of the universe is much more complex. Assuming that dark matter is similarly complex, there may exist an entire hidden sector of matter composed of multiple types of dark matter particles, with their own self-interactions. The canonical example of such an interaction would be a dark electromagnetic force mediated by a dark photon. This massive U(1) gauge boson would kinetically mix with Standard Model photons, which can then be measured by the standard haloscope used in axion searches. When taking the dark photon to comprise the majority of the hidden sector, deep exclusions can be made in the mass range that haloscopes are sensitive to, improving current limits by three orders of magnitude. I will present results for a search for dark photons with the HAYSTAC experiment in the mass regions of 16.96-17.12, 17.14-17.28, and 23.15-24.0 μeV .

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