

Dark Photons from the Sun

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We propose a novel search for dark matter using the directional capabilities of the AMS-02 telescope to identify dark photons coming from dark matter annihilation. Dark matter collects in the core of the Sun and annihilates into dark photons which then decay to known particles on their way to the Earth. For weak-scale dark matter, dark photons of mass MeV – GeV, and kinematic mixing parameters between 10^{-11} and 10^{-8} , this process produces smoking gun signals of dark matter that may be detected as positrons that point back to the Sun.

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