

AXIS Can Access Dark Matter Decays with the Longest Lifetimes

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As one of NASA's proposed future Astrophysics Probe missions, the Advanced X-ray Imaging Satellite (AXIS) is designed to improve on the sensitivity and spatial resolution of the Chandra X-ray Observatory. The low-background, arcsecond imaging that AXIS will deliver over a broad energy range can probe a new region of parameter space for exploring decaying dark matter candidates, such as axion-like particles (ALPs) and sterile neutrinos, via X-ray line searches. We present an initial study of AXIS's prospects for detecting dark matter decay signals, finding potential lifetime sensitivities of order $\sim 10^{30}$ seconds in the keV range, surpassing current X-ray limits by several orders of magnitude.

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