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(I) Looking in the funhouse mirror: a search for axion dark matter using stimulated decay

Tuesday 20 June 2023 09:30 (30 minutes)

In the presence of radiation from bright astrophysical sources at radio frequencies, axion dark matter can undergo stimulated decay to two nearly back-to-back photons, meaning that bright sources could have counterimages in other parts of the sky. The counterimages will be spectrally distinct from backgrounds, taking the form of a narrow radio line centered at half the axion mass with a spectral width determined by Doppler broadening in the dark matter halo. The morphology of these images can be nontrivial, with blurring due to the geometry of the source and image as well as spatial smearing due to the galactic kinematics of axion dark matter. I will show that the axion decay-induced counterimages of galactic sources may be bright enough to be detectable with ongoing observations from the FAST radio telescope as well as archival data from CHIME and other radio surveys.

Keyword-1

dark matter

Keyword-2

astroparticle physics

Keyword-3

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