

# Detecting quadratically coupled ultralight dark matter with stimulated annihilation

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Ultralight dark matter (ULDM) is one of the most promising DM candidates. Because of the Bose enhancement, we find the annihilation rate of ULDM in the presence of background photon radiation can be greatly enhanced and produce a distinctive reflected electromagnetic wave with an angular frequency equal to the ULDM mass. We propose to utilize such stimulated annihilation to probe the ULDM with the electromagnetic quadratic coupling by emitting a radio beam into space. With a power of a 50 MW emitter, we forecast the sensitivity of quadratic coupling in different local halo models for low-frequency radio telescopes, such as LOFAR, UTR-2, and ngLOBO.

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