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Searching for axion-like particles with proton tagging

The existence of an axion-like particle (ALP) would induce anomalous scattering of light by light. This process can be probed at the Large Hadron Collider in central exclusive production of photon pairs in proton-proton collisions by tagging the surviving protons using proton spectrometers. We estimate the expected bounds on the ALP-photon coupling for a wide range of masses. We show that the proposed search is competitive and complementary to other collider bounds for masses above 600 GeV, especially for resonant ALP production between 600 GeV and 2 TeV.

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