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Colliding light: photon fusion production at ATLAS

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What happens when we collide light at the highest laboratory energies? LHC beams source energetic photons that can collide to create new particles. Recently, ATLAS reported the landmark observation of photon-induced W boson pairs in the electron–muon channel using 139 fb^{-1} of $\sqrt{s}$ = 13 TeV proton–proton collision data. A hallmark of photon fusion production is the forward scattering of protons, which was recently measured using the ATLAS Forward Proton spectrometer in association with electron and muon pairs using 14.6 fb^{-1} of data. Moreover, 2.2 nb^{-1} of $\sqrt{s_{NN}}$= 5.02 TeV lead–lead collision data enabled the observation of light-by-light scattering and search for axion-like particles in diphoton final states. This talk summarizes these remarkable experimental advances using the LHC as a photon collider, opening novel probes of the Standard Model and beyond in uncharted regimes.

Are you are a member of the APS Division of Particles and Fields?

Yes

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