

Axion-like particle at the LHC

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The talk consists of two parts:

(i) The recent excess in a rare decay of the Higgs boson $H \rightarrow Z\gamma$ can be interpreted using a light axion-like particle (ALP) in the mass range of $0.05 - 0.1$ GeV. The dominant decay of such a light ALP is into a pair of collimated photons, whose decay is required to happen before reaching the ECAL detector, such that it mimics a single photon in the detector.

(ii) The sensitivities on the gauge-boson couplings g_{aZZ} , $g_{aZ\gamma}$ and g_{aWW} of an axion-like particle (ALP) are estimated at the LHC with $\sqrt{s} = 14$ TeV and integrated luminosities of 300 fb (current run) and 3000 fb (High-Luminosity LHC). We focus on the associated production processes of $pp \rightarrow Za \rightarrow (\ell^+ \ell^-)(\gamma\gamma)$ and $pp \rightarrow W^\pm a \rightarrow (\ell^\pm \nu)(\gamma\gamma)$.

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