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Deep Learning Based Tagger for Highly Collimated Photons at CMS

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In a search for an exotic Higgs boson decay, a novel signature with highly collimated photons is studied where the Higgs boson decays into hypothetical light pseudoscalar particles of the form H to AA . In the highly boosted scenario, two collimated photons from the A decay are reconstructed as a single photon object, or an artificially merged photon shower. A deep learning based tagger is developed to identify the signal merged photon signature. We utilize the images of its electromagnetic shower shape and track structures. In this talk, we present the merged photon tagger that utilizes low-level detector information and its excellent performance across different boosts of A , compared with the standard CMS photon identification algorithm.

Mini Symposia (Invited Talks Only)

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