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Vertex identification in the search for the Higgs boson decaying to two photons

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A search for a Higgs boson decaying to two photons has been performed by the CMS Collaboration at the LHC experiment using pp collisions at a center-of-mass energy of 13TeV with an integrated luminosity of 2.6/fb. In the decay of the Higgs boson into two photons, the unconverted final state photons are not detected in the tracker, so the determination of the associated primary vertex is not trivial. Moreover, the CMS ECAL has no longitudinal segmentation, it is thus not a pointing calorimeter. The information from the recoiling tracks, and, when at least one of the photons is converted in the tracker, from the conversion tracks can be used to determine the primary vertex. The vertex identification algorithm used in the search for the Higgs boson decaying to two photons is described in this presentation, together with its performance.

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