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Photon detection with the CMS ECAL in the present and at the HL-LHC and its impact on Higgs boson measurements

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The CMS experiment at the LHC features a high-resolution homogeneous electromagnetic calorimeter (ECAL). Its excellent performance in the reconstruction of high-energy photons has played a key role in the discovery of the Higgs boson and the measurement of its properties. The High-Luminosity LHC (HL-LHC) is expected to deliver an integrated luminosity 20 times larger than the LHC, allowing to study rare processes such as Higgs boson pair production and self-coupling. During HL-LHC operations, up to 200 concurrent interactions per-bunch collision are expected. In order to maintain its current performance in the harsher environment of the HL-LHC, an upgrade of the ECAL is planned. This contribution describes the ECAL performance in photon reconstruction and its impact on the measurement of the Higgs boson properties during the LHC Run II. Prospects for Higgs boson measurements at the HL-LHC are presented as well.

Summary

Presenter: CIPRIANI, Marco (ROMA1)

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