

Electron reconstruction and Z measurement in the di-electron channel in PbPb collisions with CMS

We report on the measurement of Z boson production and decay in the di-electron channel in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV by the CMS experiment at the LHC. We observe about 30 events containing a pair of electrons which were reconstructed to form distinctive Z boson candidates. Z boson reconstruction in the electron channel is challenging due to the complexity of electron reconstruction in the high-occupancy environment of heavy-ion (HI) collisions. The reconstruction of electrons in CMS uses information from the pixel detector, the silicon strip tracker and the electromagnetic calorimeter (ECAL). The measurement of electron energy in the ECAL is degraded by the significant tracker material in front of the calorimeter, and by the presence of a strong magnetic field aligned with the beam axis, giving an azimuthal spread of electromagnetic clusters within the ECAL. Despite this challenging reconstruction environment, we are able to reconstruct electrons with dedicated heavy ion tracking and tuned clustering algorithms. The performance of electron reconstruction in Pb-Pb collisions is presented. In particular, the Z measurement in the di-electron channel is presented as a first observation and a main result of electron reconstruction in HI collisions.

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Track Classification: Electromagnetic probes