Photon Identification Calibration using electrons from Z decays

Photons are important particles in collider physics. They play a crucial role in Standard Model (SM) processes, Higgs decays, or any potential new interactions that beyond the Standard Model. Therefore, photon identification efficiency is indispensable for many interesting physical analyses in collider physics. This poster presents the electron extrapolation method for photon identification efficiency measurement in ATLAS experiment. Electrons from $Z \rightarrow e^+e^-$ decays were selected by a tag-and-probe method, and transformed to photon-like samples based on the similarities between the shower shapes of electrons and photons in the electromagnetic calorimeter to extract the photon identification efficiency. Efficiencies are measured in regions of pseudorapidity in $0 < |\eta| < 2.37$ except for the crack regions $1.37 < |\eta| < 1.52$ and transverse momentum across the range $25 < E_T < 250$ GeV. Comparisons were made with corrected direct-photon MC, and scale factors were calculated.

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Session Classification: 分会场一

Track Classification: TeV 物理和超出标准模型新物理