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Estimation of electron-to-photon misidentification rate in Z(νν)γ measurements for conditions of ATLAS experiment during Run II

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Z-peak tag-n-probe method was widely used for estimation of electron-to-photon misidentification rate for photon-oriented studies in Run I and in early Run II pp-collisions data. The increased luminosity and energy of collisions in Run II requires an improvement of the existing method, especially it is necessary for a description of underlying background spectra in the Z boson mass region of tag-n-probe mass distribution. This study presents the improved ways of tag-n-probe mass spectra fit in order to estimate a pure number of tag-n-probe events originating from the Z boson. Two approaches are considered. The first fit with exponential polynomial functions does not include the Z peak itself. And the second one includes the Z peak, which is described by a Voigtian function. Comparison of e-to-γ misidentification rate estimation with two approaches is presented. The study is done for photons selected in Z(νν)γ measurements, which use 139 fb^{-1} of data collected by the ATLAS experiment during full Run II at LHC.

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