Contribution ID : **186** Type : **Oral talk**

Improvement of boson mass resolution by correction for final state radiation in the CEPC detector

Friday, 30 October 2026 10:45 (15)

In different analyses of higgsstrahlung process at CEPC, the final states with leptons from Z boson decays provide a very clean environment for studies of Higgs boson parameters. While the channel $Z \to \mu^+\mu^-$ is the most precise, the channel $Z \to e^+e^-$ suffers from final state radiation losses. In the proposed CEPC detector designed for the application of Particle Flow approach, momenta of charged particles are reconstructed from the tracker, while an energy of gammas — from the electromagnetic calorimeter. In this study, the impact of electromagnetic calorimeter resolution on the correction for final state radiation is estimated. It is demonstrated that the correction of electron energy for final state radiation in the CEPC detector can improve the boson mass resolution by about a factor of two and make it comparable with that without radiation.

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Session Classification : High energy physics: experiment

Track Classification : High energy physics: experiment