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Dielectron production in pp collisions at sqrt(s)=13 TeV measured in a dedicated low magnetic-field setting with ALICE

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Low-mass dielectrons are an important probe for the hot and dense medium which is created in ultra-relativistic heavy-ion collisions. Since leptons do not interact strongly and are produced throughout the whole collision process, they carry information from all collision stages with negligible final-state interaction.

The ALICE detector is well-suited to perform this measurement due to its excellent tracking and particle identification capabilities at low momenta. However, Dalitz decays and photon conversions lead to a high combinatorial background with a signal-to-background ratio of 1:10 to 1:1000 in Pb-Pb collisions, depending on the invariant mass. Therefore, the minimization of the background is a key aspect of this analysis.
The reconstruction efficiency of low-p_{T} electrons can be increased by reducing the magnetic field of the ALICE central barrel solenoid from 0.5 T to 0.2 T. This allows a better rejection of the electron background and simultaneously gives the opportunity to increase the accessible phase space of the dielectron measurement. Such a configuration is planned in ALICE for part of the Pb-Pb campaigns in LHC Run 3 and 4 from 2021 on.

This poster will present the status of the dielectron measurement in pp collisions at $\sqrt{s}$ = 13 TeV from pilot runs taken with B=0.2 T in the ALICE central barrel. It will be shown how the analysis was adapted to the reduced-field configuration. The results will be compared to reference data recorded with the nominal field, to illustrate the benefits of the low magnetic field setting. Finally, the invariant-mass and pair-transverse-momentum distributions will be compared to the expected yield from known hadronic sources.

Content type

Experiment

Collaboration

ALICE

Centralised submission by Collaboration

Presenter name already specified

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