

Direct-photon and heavy-flavour production in proton–proton collisions at $\sqrt{s} = 7$ TeV with ALICE

Low-mass dielectron measurements play an essential role in the study of the Quark-Gluon Plasma (QGP) created in ultra-relativistic heavy-ion collisions. They are produced in all stages of the collision and are not affected by final-state interactions. Thus, they provide a penetrating probe of the created medium.

In the dielectron intermediate-mass region a measurement of the thermal radiation from the QGP gives information on the medium temperature.

However, in this region the main component of the dielectron continuum stems from correlated semi-leptonic decays of charm and beauty hadrons. Therefore, it is crucial to understand the primordial heavy-flavour production in vacuum and find a way to separate this contribution from the thermal dielectron signal of the QGP. This can be studied in proton-proton collisions.

In this poster, we will present the production of correlated e^+e^- pairs in pp collisions at $\sqrt{s} = 7$ TeV with ALICE. The final results on the dielectron yield will be compared with the expectations from known hadronic sources as a function of m_{ee} , $p_{T,ee}$, and the pair distance of closest approach to the primary vertex DCA_{ee} . The measurement of the fraction of direct photons to inclusive photons will be reported. The extraction of the charm and beauty cross sections from a fit of the data with different Monte-Carlo generators will be presented, discussing the insights on the production mechanisms of heavy-quark production this can give.

We will show how the DCA_{ee} variable allows the separation of prompt and non-prompt dielectron pairs and thus, can help to disentangle possible thermal radiation from the charm and beauty contribution. Finally, we will give prospects for this analysis in proton-lead collisions.

Summary

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