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Dielectron production in pp and Pb-Pb collisions with ALICE in Run 3

The measurement of dielectron production is a fundamental piece of the puzzle in the understanding of the hot and dense matter produced in ultra-relativistic heavy-ion collisions. The dielectron spectrum provides information that penetrates the veil of final-state hadronic interactions and provides direct access to the early phases of the collision. However, the interpretation of the measured spectra relies on a precise understanding of all the contributing sources.

In this talk, we present the measurement of dielectron production in the high-precision proton-proton data collected with the upgraded ALICE detector at $\sqrt{s} = 13.6$ TeV. This establishes a crucial baseline for all measurements of dielectron production in larger collision systems. Utilizing the new inner tracking system, dielectron pairs from semi-leptonic decays of heavy-flavor hadrons are identified and subtracted using a data-driven approach.

The possibilities of using the extracted spectrum of prompt dielectrons over a wide mass range are discussed in the context of a possible onset of thermal radiation or the production of dielectron pairs via the Drell-Yan process in a regime where no reliable calculations based on perturbative QCD are available. We will in addition show the status of the analysis of the Pb-Pb data collected during LHC Run 3.

Secondary track

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