

10th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions



Contribution ID: 141

Type: Oral Presentation

Low-mass dielectron measurements in Pb-Pb collisions with ALICE at the LHC

Tuesday, June 2, 2020 12:20 PM (20 minutes)

The production of low-mass dielectrons is one of the most promising tools for the understanding of chiral symmetry restoration and the thermodynamical properties of the Quark-Gluon plasma (QGP) created in ultra-relativistic heavy-ion collisions. For low invariant masses ($m_{ee} < 1.1 \text{ GeV}/c^2$), the dielectron invariant-mass spectrum is sensitive to the properties of short-lived vector mesons in the medium and modifications related to chiral symmetry restoration. Thermal radiation emitted by the system, both during the partonic and hadronic phase, contributes to the dielectron yield over a broad mass range and gives insight into the thermodynamic properties of the medium. In the intermediate-mass region ($1.1 < m_{ee} < 2.8 \text{ GeV}/c^2$), the measurement of thermal dielectrons from the QGP is very challenging at the LHC due to the dominant contribution of correlated e^+e^- pairs from semileptonic decays of charm and beauty hadrons. Finally, at very low pair transverse momenta initial photon annihilation and photonuclear processes, triggered by the coherent electromagnetic fields of the incoming nuclei, are expected to play a role in more peripheral collisions.

In this talk, we will present dielectron measurements with ALICE in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02 \text{ TeV}$ for different centralities. In particular, the new results obtained analysing 2018 Pb-Pb data, which provide higher statistical precision compared to previous measurements, will be shown. The results will be compared to the expected dielectron yield from known hadronic sources as well as several predictions for the thermal radiation from the hadronic gas and QGP phases.

Collaboration (if applicable)

ALICE

Track

Electroweak Probes

Contribution type

Contributed Talk

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Session Classification: Parallel

Track Classification: Electroweak Probes