

Dilepton measurements with ALICE at the LHC

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Dielectrons and dimuons are a powerful probe of the quark-gluon plasma (QGP) created in ultra-relativistic heavy-ion collisions, since they do not interact strongly and are emitted during all stages of the collisions. At low invariant mass, the dilepton spectrum is sensitive to in-medium modification of the ρ meson spectral function and to effects related to the chiral symmetry restoration. In the intermediate-mass region the dominant contribution is given by correlated pairs from semileptonic decays of charm and beauty hadrons. Thermal radiation from the QGP contributes as well to the dilepton yield over a broad mass range and gives insight into the temperature of the medium. At very low pair transverse momenta, dielectrons are produced by mainly coherent photon-photon interactions as well.

Measurements in pp and p-Pb collisions are the necessary reference for heavy-ion studies. Moreover, they can be used to extract charm and beauty cross sections.

In this talk, we will present the latest measurements of e^+e^- and $\mu^+\mu^-$ pair production in pp, p-Pb and Pb-Pb collisions performed by ALICE at different energies. In particular, results from the 2018 Pb-Pb run and multiplicity dependent studies in pp collisions, including a soft dielectron excess over known hadronic sources, will be shown.

The expected performance of dilepton measurements with the upgraded ALICE detector in LHC Run 3 and 4 will also be discussed.

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Secondary track (number)

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