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Direct photon production and HBT correlations in Pb–Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV with the ALICE experiment

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Measurements of direct photons can provide valuable information on the properties and dynamics of the quark-gluon plasma (QGP) by comparing them to model calculations that describe the whole evolution of the system created in heavy-ion collisions, from the initial conditions to the pre-equilibrium, QGP, and hadronic phases.

In the ALICE experiment, photons can be reconstructed either by using the calorimeters or via conversions in the detector material. The photon conversion method benefits from an excellent energy resolution and is able to provide direct photon measurements down to $p_T = 0.4$ GeV/c. For Hanbury Brown and Twiss (HBT) correlation studies, the detector setup can be exploited to combine a conversion photon with a calorimeter photon, such that near-zero opening angles are measured.

In this talk, we present the first measurements of direct photon production in Pb–Pb collisions at $\sqrt{s_{\text{NN}}} = 5.02$ TeV by ALICE, including direct photon spectra from central to peripheral events. The latest results of the first analysis of photon HBT correlations will be shown as well.

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