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Low-Mass Dielectron Production in pp, p-Pb and Pb-Pb Collisions with ALICE

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Electron-positron pairs (dielectrons) are an excellent experimental probe to investigate the properties of the quark-gluon plasma formed in ultra-relativistic heavy-ion collisions. Because they do not interact strongly, their spectra reflect the entire space-time evolution of the collision. The created medium can modify the dielectron production with respect to the vacuum rate. Therefore, measurements in pp collisions serve as a medium-free baseline while the measurements in p-Pb collisions help to separate cold nuclear matter effects from

those of the hot and dense medium. In this contribution, dielectron measurements in all collision systems using the central barrel of ALICE are presented. Electrons at mid rapidity are identified via a combined method using their specific energy loss in the Inner Tracking System (ITS) and Time Projection Chamber (TPC) together with time of flight information of the TOF detector.

Preliminary results on the dielectron production will be compared to the expected contributions from hadronic sources in pp collisions at $\sqrt{s} = 7$ TeV, in p-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV and in Pb-Pb collisions at $\sqrt{s_{NN}} = 2.76$ TeV. Based on those distributions we discuss also constraints on the heavy-flavour production. An outlook for the measurements at $\sqrt{s_{NN}} = 5.5$ TeV using the upgraded ALICE detector after the second long shutdown of the LHC will also be presented.

Summary

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