Contribution ID: **481** Type: **Parallel**

Low mass dielectron measurements in pp, p-Pb and Pb-Pb collisions with ALICE at the LHC

Saturday 7 July 2018 17:42 (18 minutes)

Low-mass dielectron pairs are unique experimental tool for the studies of the Quark-Gluon Plasma (QGP) created in ultra-relativistic heavy-ion collisions at the LHC. Such pairs are produced during all stages of the collision and carry the information about the whole space-time evolution of the system unperturbed by final-state interactions. The dielectron continuum is very rich in physics sources: on top of ordinary Dalitz and resonance decays of pseudo-scalar and vector mesons, thermal black-body radiation is of particular interest as it contains the information about the temperature of the hot and dense system created in such collisions. The dielectron invariant-mass distribution is also sensitive to medium modifications of the spectral function of short-lived vector mesons that are linked to the potential restoration of chiral symmetry at high temperatures. Correlated electron pairs from semi-leptonic charm and beauty decays provide complementary information about the heavy-quark energy loss. Such pairs dominate in the intermediate mass region ($1.2 < m_{\mathrm{ee}} < 2.8$ GeV/c^2) and can be used for a complementary measurement of the heavy-flavour production cross-section. The studies of the minimum-bias proton-proton and proton-ion collisions provide crucial vacuum and cold-nuclear matter references needed for the interpretation of the heavy-ion results. Recent observations of collective effects in high-multiplicity pp and p-Pb collisions show surprising similarities with those in heavy-ion collisions. Measurements of low-mass dielectrons in such events could provide additional information regarding the underlying physics processes.

In this talk, we present the latest results from the ALICE experiment in all three collisions systems: in pp at $\sqrt{s}$ = 7 TeV and 13 TeV, in p-Pb at $\sqrt{s_{\mathrm{NN}}}$ = 5.02 TeV and Pb-Pb at $\sqrt{s_{\mathrm{NN}}}$ = 2.76 TeV and 5.02 TeV. This includes analyses making use of impact parameter information to identify dielectrons from heavy-flavour decays as well as machine learning techniques to improve electron identification and combinatorial background rejection. To single out the interesting phenomena, the dielectron spectra are compared to the expectations from known hadronic sources. The implications for the heavy-flavour and direct photon production will be discussed. Furthermore, the results will be shown as a function of the charged-particle event multiplicity and of the centrality of the collision.

Primary author: VOROBYEV, Ivan (Technische Universitaet Muenchen (DE))

Presenter: VOROBYEV, Ivan (Technische Universitaet Muenchen (DE))

Session Classification: Heavy Ions

Track Classification: Heavy Ions