XXIV QUARK MATTER DARMSTADT 2014

Contribution ID: **94** Type: **Contributed Talk**

Heavy-flavour production and nuclear modification factor in Pb-Pb collisions at $\sqrt{s_{\rm NN}}$ =2.76 TeV with ALICE

Monday 19 May 2014 11:40 (20 minutes)

Heavy quarks (charm and beauty) are considered effective probes to investigate the properties of the strongly-interacting medium formed in high energy nuclear collisions. Heavy quarks lose energy interacting with the medium via inelastic processes (medium-induced gluon radiation) and elastic collisions. The nuclear modification factor, $R_{\rm AA}$, defined as the ratio of the heavy-flavour production yield in nucleus-nucleus collisions to the binary scaled pp one, is an observable sensitive to in-medium energy loss. In particular, the comparison of the $R_{\rm AA}$ of charm, beauty and light-flavour hadrons provides information about the colour charge and parton mass dependence of the energy loss.
Open heavy-flavour production was measured with ALICE in Pb-Pb collisions at $\sqrt{s_{\rm NN}} = 2.76$ TeV using D mesons ($\rm D^0$, $\rm D^{*+}$, $\rm D^+$ and $\rm D_s^+$) reconstructed from their hadronic decays and electrons from heavy-flavour decays at central rapidity, and muons from heavy-flavour decays at forward rapidity. The D meson and heavy-flavour decay leptons differential $R_{\rm AA}$ measurements, namely the transverse momentum, rapidity and centrality dependence, will be shown. The comparison of the nuclear modification factors of strange and non-strange D mesons will be presented, as well as the $\rm D^0$ $R_{\rm AA}$ measured in different azimuthal regions with respect to the reaction plane of the collision. The D meson $R_{\rm AA}$ will be compared with light-flavour and non-prompt $\rm J/\psi$ results (from the CMS experiment). In addition, the heavy-flavour $R_{\rm AA}$ and v_2 will be compared to results from Au-Au collisions at $\sqrt{s_{\rm NN}} = 200$ GeV measured at RHIC. Finally, the heavy-flavour measurements will be compared to theoretical models.

On behalf of collaboration:

ALICE

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Session Classification: Heavy flavor

Track Classification: Open Heavy Flavour and Quarkonia