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J/ ψ production at mid-rapidity in Pb-Pb collisions at 2.76 TeV

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The hot and dense nuclear matter created in nuclear collisions at relativistic energies consists of a plasma of deconfined quarks and gluons. Due to their large mass, the charm quarks are mainly formed in the first instants of the nuclear collision and will consequently experience the full history of the system. It was predicted that the strongly bound J/ψ state will be suppressed in the hot and deconfined quark-gluon plasma due to the color screening effect. This effect was already observed in Au-Au collisions at $\sqrt{s_{NN}} = 200$ GeV at RHIC. It was also predicted that high production yields of charm quarks in nucleus-nucleus collisions at RHIC and especially at LHC energies will make possible (re)combination thus possibly leading to J/ψ enhancement compared to lower energy nuclear collisions and to pp collisions.

ALICE measures the J/ψ at mid-rapidity, $|y| < 0.9$, down to zero transverse momentum. The reconstruction is performed using the J/ψ decay into the di-electron channel. The electron identification is done using energy loss in gaseous detectors (the Time Projection Chamber and the Transition Radiation Detector) and the time-of-flight method (Time Of Flight detector). We will present the J/ψ nuclear modification factor as a function of the collision centrality. Discussions and comparisons to theoretical calculations will be provided. First results and perspectives on the J/ψ production with respect to the event plane (elliptic flow) will also be shown.

Primary author: ALICE, Collaboration (CERN Geneva, Switzerland)

Co-author: ARSENE, Ionut Cristian (GSI - Helmholtzzentrum für Schwerionenforschung GmbH (DE))

Presenter: ARSENE, Ionut Cristian (GSI - Helmholtzzentrum für Schwerionenforschung GmbH (DE))

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