

Recent ALICE results on charmonium production in Pb-Pb collisions

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The ALICE detector is specifically designed for allowing a precise characterization of the quark-gluon plasma (QGP), a deconfined phase of nuclear matter which can be formed in heavy-ion collisions. Heavy quarks, i.e. charm and beauty, are created in the hard partonic scatterings at the early stage of the collision, prior to QGP formation, and could thus experience energy loss, transport, thermalisation and hadronisation during the QGP phase. Charmonia, bound states of charm and anti-charm quarks, are sensitive probes of the deconfined medium, exhibiting a rich phenomenology.

In this talk, I will present recent results from the ALICE Collaboration on the production of the charmonium state J/ψ in Pb-Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV, at mid- and forward rapidity, exploiting the full Run 2 data sample. In particular, I will report on the nuclear modification factor for inclusive, prompt and non-prompt J/ψ , defined as the yield in heavy-ion collisions normalized to the binary scaled yield measurement in pp collisions at the same energy. The J/ψ anisotropic azimuthal distribution (flow), indicating a hydrodynamic expansion pattern, will also be presented. Novel results on the excited charmonium state $\psi(2S)$, measured at forward rapidity, will also be discussed. The talk will conclude with a brief summary of our current physics understanding and an outlook regarding foreseen charmonium measurements during the Run 3 of the LHC.

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