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## Quarkonium production in heavy-ion collisions with ALICE

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Charmonium production has long been identified as one of the golden probes to study the quark–gluon plasma (QGP). In fact, the early production of heavy quarks ( $c\bar{c}$  and  $b\bar{b}$ ) make charmonia an ideal tool to investigate the evolution of the hot and dense medium produced in ultra-relativistic heavy-ion collisions. Moreover, at LHC energies the recombination of uncorrelated charm quarks pairs, namely (re)generation, was found to significantly affect charmonium observables, in contraposition to the well known suppression mechanism. This aspect makes the production measurements of ground and excited states more and more relevant to discriminate among the scenarios foreseen by the different theoretical models. In addition, the possibility to isolate the non-prompt charmonia, i.e. originating from beauty hadron decays, provides an insight into the energy loss experienced by the ancestor beauty quarks inside the QGP. In this contribution, recently published results by the ALICE collaboration of inclusive charmonia production obtained at central and forward rapidity in Pb–Pb collisions at  $\sqrt{s_{NN}} = 5.02$  TeV will be presented. At midrapidity, the measurements of prompt and non-prompt  $J/\psi$  production will be shown, while at forward rapidity the measurement will be extended to the excited state as the  $\psi(2S)$ . Finally, the first preliminary measurement of the  $\psi(2S)$ -to- $J/\psi$  ratio obtained with the new data sample collected in Pb–Pb collisions at  $\sqrt{s_{NN}} = 5.36$  TeV will be presented.

### Category

Experiment

### Collaboration (if applicable)

ALICE

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