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Nuclear modification factors of prompt and non-prompt J/ψ in Pb–Pb collisions at $\sqrt{s_{NN}} = 5.02$ TeV at midrapidity with ALICE

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Ultrarelativistic nuclear collisions offer an opportunity to study the production of heavy quarkonia as well as the properties of nuclear matter at extreme temperature and density. Heavy quarks are considered excellent probes to study the properties of the state of matter where quarks and gluons are deconfined, known as quark-gluon plasma (QGP) expected to be formed in nuclear collisions.

Prompt J/ψ are produced directly or from the feed-down of higher-mass charmonium states, and are sensitive to suppression and recombination effects in the QGP and at hadronization. Non-prompt J/ψ production originates from the weak decays of beauty hadrons and is directly related to that of beauty quarks. In nuclear collisions, such measurements are important to investigate the energy loss dependence on the quark mass in the hot nuclear medium as well as for providing additional constraints to extract heavy-quark diffusion coefficients from experimental data.

In this contribution, ALICE results on nuclear modification factors (R_{AA}) of prompt and non-prompt J/ψ , reconstructed at midrapidity in the dielectron decay channel, as a function of p_T and centrality will be presented and compared with theoretical predictions. Presented results are obtained by analyzing data from Pb–Pb collisions collected at $\sqrt{s_{NN}} = 5.02$ TeV during LHC Run 2. In addition, prompt and non-prompt J/ψ cross sections in pp collisions at the same energy will also be shown.

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