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Quarkonium tomography of heavy ion collisions at the LHC

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Quarkonium production in high-energy hadronic collisions provides a fundamental test of QCD. Its modification in a nuclear medium is a sensitive probe of the space-time temperature profile and transport properties of the QGP, yielding constraints complementary to the ones obtained form the quenching of light and heavy flavor. We will present new results for the suppression of high transverse momentum charmonium $[J/\psi, \psi(2S)]$ and bottomonium $[\Upsilon(1S), \Upsilon(2S), \Upsilon(3S)]$ states in Pb+Pb collisions at the Large Hadron Collider. Our theoretical formalism combines the collisional dissociation of quarkonia, as they propagate in the quark-gluon plasma, with the thermal wavefunction effects due to the screening of the $Q\bar{Q}$ attractive potential in the medium. We find that a good description of the relative suppression of the ground and higher excited quarkonium states, transverse momentum and centrality distributions is achieved, when comparison to measurements at a center-of-mass energy of 2.76 TeV is performed. Theoretical predictions for the highest Pb+Pb center-of-mass energy of 5.02 TeV at the LHC, where new experimental results are being finalized, will also presented. Finally, we will show the latest theoretical calculations at forward rapidity and in smaller systems, such as Xe+Xe.

Content type

Theory

Collaboration

Centralised submission by Collaboration

Presenter name already specified

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