

Spectroscopy in the quark-gluon plasma with bottomonia

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The suppression of Upsilon-mesons in the hot quark-gluon medium (QGP) versus reduced feed-down is investigated in heavy-ion collisions at energies reached at RHIC and at LHC. Our centrality- and p_T -dependent model encompasses screening, collisional damping and gluodissociation in the QGP. For $Y(1S)$ it is in agreement with both STAR and CMS data provided the relativistic Doppler effect and the reduced feed-down from the $Y(nS)$ and $\chi_b(nP)$ states are properly considered.

At both energies, most of the $Y(1S)$ -suppression is found to be due to reduced feed-down, whereas the main $Y(2S)$ suppression is caused by hot-medium effects in the collectively expanding QGP. The importance of reduced feed-down increases with energy. The p_T -dependence is flat due to the relativistic Doppler effect. Possible suppression effects due to the transient electromagnetic fields in more peripheral collisions are shown to be negligible. The predicted $Y(1S)$ -suppression in Pb-Pb at $\sqrt{s_{NN}} = 5.02$ TeV is compared with CMS data. Cold nuclear matter effects are discussed for p-Pb at the same energy.

[1] J. Hoelck, F. Nendzig, and G. Wolschin, Phys. Rev. C 95, 024905 (2017).

[2] J. Hoelck and G. Wolschin, Eur. Phys. J. A, 53 (2017).

Summary

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