

ψ' production and B decay in heavy ion collisions at LHC

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Based on a transport approach, we have calculated the ratio of nuclear modification factors of inclusive ψ' and ψ in heavy ion collisions at LHC energy [1]. We have found that after experiencing the hot medium created in the early stage of the collisions, a part of the promptly produced J/ψ s still survive and dominate the final state J/ψ distributions, but most of the prompt ψ' s are dissociated in the hot medium, and the finally observed ψ' s are mainly from the B-hadron decay. Therefore, the ratio of nuclear modification factors of inclusive ψ' and ψ in semi-central and central heavy ion collisions is controlled by the B decay. Our transport approach calculations agree reasonably well with the LHC data [2,3] in most transverse momentum and rapidity regions, but fail to explain the data in the region of $3 < p_t < 30$ GeV/c and $1.6 < y < 2.4$ as shown in Fig. 1. The big difference between the theory and the data needs further theoretical study and precise experimental measurement.

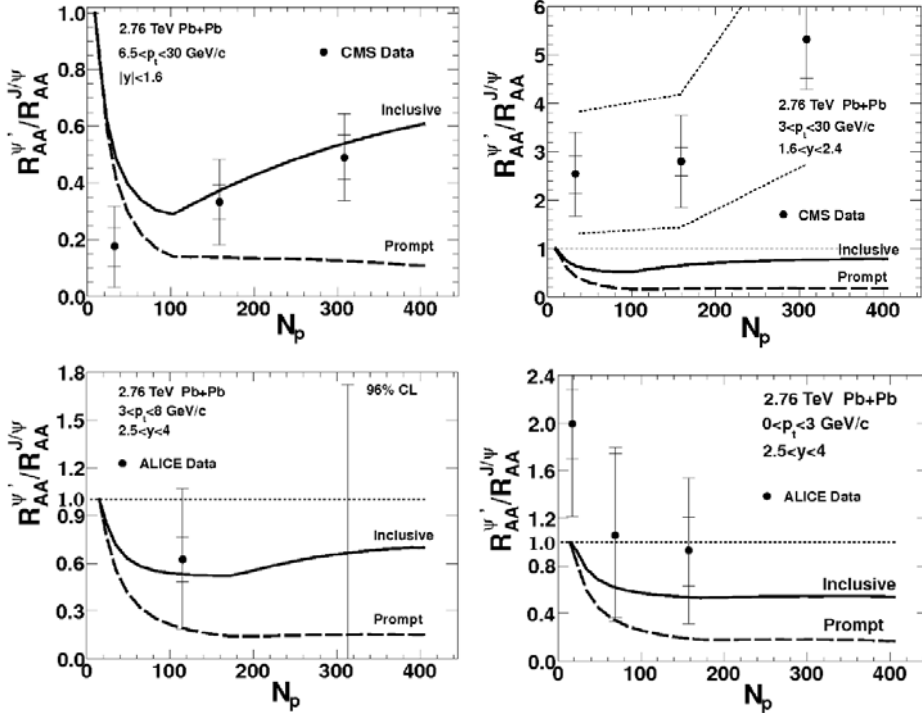


FIG. 1. Ratio of ψ' and ψ nuclear modification factors as a function of number of participants N_p . The data are from the CMS [1] (top windows) and ALICE (bottom windows) [2] collaborations, and the solid and dashed lines are, respectively, the transport model calculations with and without considering the B decay contribution.

- [1] B. Chen, Y. Liu, K. Zhou, and P. Zhuang, Phys. Lett. B **726**, 725 (2013).
- [2] D. Moon, [for the CMS Collaboration], arXiv:1209.1084v2[hep-ex].
- [3] E. Scapparini, [for the ALICE Collaboration], arXiv:1211.1623[nucl-ex].