

# 10th International Conference on Hard and Electromagnetic Probes of High-Energy Nuclear Collisions



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## Probing X(3872) structure via final state interactions

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Recently, LHCb collaboration has presented the relative production rates of promptly produced X(3872) over  $\psi(2S)$  as a function of particle multiplicity, given by the total number of charged particle tracks reconstructed in the VELO detector for the forward pseudorapidity region,  $2 < \eta < 5$ . This ratio is found to decrease with increasing multiplicity.

In fact, suppression of weakly-bound quarkonia states has been studied for decades in proton-nucleus collisions. Models incorporating final state effects, such as breakup via interactions with comoving hadrons, are able to describe the relative suppression of excited-over-ground quarkonium states in pA collisions.

In the case of proton-proton collisions, these final state effects can affect the quarkonia production for multiplicities higher than the mean value, giving rise to a suppression that evolves with the increase of comoving particles.

We present our results for the ratio of X(3872) over  $\psi(2S)$  compared to LHCb data from proton-proton collisions. They are consistent with the interpretation of the X(3872) as being a tetraquark with a size between 1 to 2 fm and a binding energy of the order or smaller than the one of the  $\psi(2S)$ . They disfavor the interpretation of the X(3872) as weakly bound hadronic molecule of large size.

We extend our study to PbPb collisions by the inclusion of recombination effects and compare our results to the available CMS data.

### Collaboration (if applicable)

### Track

Heavy Flavor and Quarkonia

### Contribution type

Contributed Talk

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