

# 1 Recent quarkonium results from the STAR experiment

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## 3 **Abstract**

4 Quarkonium measurements in heavy-ion collisions provide insight into the mech-  
5 anisms which cause the quarkonium bound states to dissociate in the Quark-Gluon  
6 Plasma (QGP). The  $J/\psi$  suppression and  $\Upsilon$  sequential melting provide informa-  
7 tion on the thermodynamic properties of the QGP, in particular the initial medium  
8 temperature. Quarkonium studies in  $p+p$  and  $p+A$  collisions serve as the necessary  
9 baselines for heavy-ion collisions. They also help to understand the quarkonium pro-  
10 duction mechanism and the cold nuclear matter effects in  $p+p$  and  $p+A$  collisions,  
11 respectively. In particular, the charged particle multiplicity dependent studies of  
12 quarkonium production in  $p+p$  collisions could provide information on the interplay  
13 of hard vs. soft QCD processes during initial stages.

14 This contribution will focus on recent quarkonium studies from the STAR ex-  
15 periment at RHIC. We will present the  $J/\psi$  and  $\Upsilon$  measurements in  $p+p$  collisions  
16 at  $\sqrt{s} = 200$  and 500 GeV including production cross section,  $J/\psi$  production in  
17 jets and with jet activity, and normalized quarkonium yield as a function of nor-  
18 malized charged particle multiplicity. Nuclear modification factors and elliptic flow  
19 of  $J/\psi$  and  $\Upsilon$  states in various collision systems ( $p+Au$ ,  $Au+Au$  and isobar) at  
20  $\sqrt{s_{NN}} = 200$  GeV will be also shown. The presented measurements will be com-  
21 pared to different model predictions and physics implications will be discussed.