

# Study of multiplicity dependence of quarkonium production in pp collisions

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Our universe has begun with the Big Bang. After the Big Bang a highly dense state of matter was created that we call Quark Gluon Plasma. It is a mixture of deconfined quarks and gluons which are elementary particles as we know today. Quarkonium states can be used to study the properties of such QGP, because they are expected to dissociate at a very high temperature reached in the QGP. This provides insight into the conditions present in the early Universe.

In this presentation, basic information about quarkonium states like  $J/\psi$  and  $\Upsilon$  and their different excited states will be presented. Various aspects of quarkonium interaction with the QGP will be discussed, including suppression and regeneration. Recent results will also be presented. Furthermore, basic quarkonium production models will be discussed. Finally, the results of recent studies of quarkonium production dependence on charged particle multiplicity at RHIC and LHC will be shown along with relevant model predictions. A new study of Upsilon production vs. charged particle multiplicity, using a large dataset of p+p collisions at  $\sqrt{s} = 500$  GeV recorded by the STAR experiment, will be proposed.

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