

# High $p_T$ quarkonia production and suppression in Pb+Pb collisions

Vineet Kumar<sup>1,2</sup> and Prashant Shukla<sup>1,2,\*</sup>

<sup>1</sup>*Nuclear Physics Division, Bhabha Atomic Research Center, Mumbai, India*

<sup>2</sup>*Homi Bhabha National Institute, Anushakti Nagar, Mumbai, India*

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## Abstract

We calculate the high  $p_T$  quarkonia production using NRQCD method. Different methods of quarkonia suppression are used to explain the high  $p_T$  quarkonia suppression observed by CMS in LHC

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\* pshukla@barc.gov.in

## I. INTRODUCTION

Heavy-ion collisions at relativistic energies are performed to create and characterize quark gluon plasma (QGP), a phase of strongly-interacting matter at high energy density where quarks and gluons are no longer bound within hadrons. The quarkonia states ( $J/\psi$  and  $\Upsilon$ ) have been some of the most popular tools since their suppression was proposed as a signal of QGP formation [1]. The understanding of these probes has evolved substantially via measurements through three generations of experiments: the SPS (at CERN), RHIC (at BNL) and the LHC (at CERN) and by a great deal of theoretical activity. (For recent reviews see Refs. [2–4].) Quarkonia are produced early in the heavy-ion collisions and, if they evolve through the deconfined medium, their yields should be suppressed in comparison with those in  $pp$  collisions. The first such measurement was the ‘anomalous’  $J/\psi$  suppression discovered at the SPS which was considered to be a hint of QGP formation. The RHIC measurements showed almost the same suppression at a much higher energy contrary to expectation [4, 5]. Such an observation was consistent with the scenario that, at higher collision energies, the expected greater suppression is compensated by  $J/\psi$  regeneration through recombination of two independently-produced charm quarks [6].

In this paper, we calculate  $J/\psi$  and  $\Upsilon$  production and suppression

## II. SUMMARY

## III. ACKNOWLEDGEMENT

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