

Friday, August 7th  
1:30 PM Session

# **Momentum spectra of bottomonium in heavy-ion collisions**

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Shortly after the Big Bang, the early universe consisted of a dense nuclear medium that took a short time to expand and form hadrons from quarks and gluons; this medium is called the quark-gluon plasma (QGP). It is believed that a QGP can be created in ultra-relativistic heavy ion collisions (URHICs), and that heavy quarks created early in the collision act as a probe of the QGP. We investigate models of producing bottomonium states in ultra-relativistic heavy ion collisions (URHICs) at RHIC and LHC energies in order to describe the regeneration of bottomonia from the QGP as it depends on transverse momentum. To simulate the evolution of the bottomonium abundance in URHICs, we rely on the results of a kinetic rate equation approach, which describes the number of bottomonia as it approaches equilibrium. We first implement a blastwave model to estimate the momentum spectra of locally thermalized Upsilon states, boosted by a flow field. However, since the Upsilon is not fully thermalized in the QGP, we employ a quark coalescence model in the calculation of its in-medium distribution. Finally, the total nuclear modification factor is calculated accounting for the interplay of suppression and regeneration mechanisms of bottomonia in heavy ion collisions as compared to proton-proton collisions.