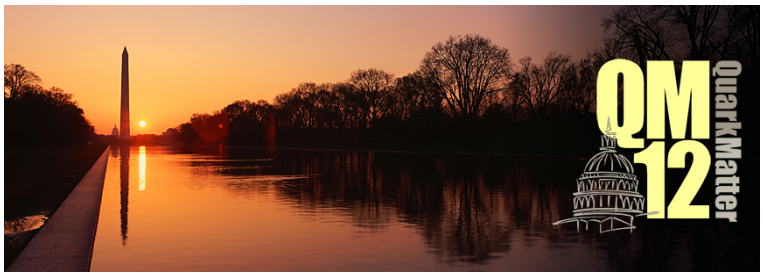

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Elastic scattering: The undersides of quarkonia propagation and collectivity in the QGP

Thursday, August 16, 2012 4:00 PM (2 hours)

One of the most advocated probes of the quark gluon plasma (QGP) properties is the J/ψ suppression. However, the comparison between experimental data and theoretical scenarios is still rather inconclusive, as several mechanisms might participate to explain the observed suppression (sequential suppression, dynamical or statistical recombination, formation time,...), not to mention the cold nuclear matter effects. In recent experimental studies at PHENIX and STAR, the v_2 of the J/Ψ's has been measured. In conjunction with R_{AA}, this observable should improve our understanding of quarkonia production in the QGP and puts higher constrains on models aiming at describing the J/ψ suppression. However, most of them neglect the possible diffusion of $Q\bar{Q}$ correlations ("pre J/ψ's") in the QGP although it is
generically an essential ingredient for the understanding of the v_2 of all particles.

Motivated by SPS results of $v_2^{J/\psi}$ and recent RHIC and LHC results suggesting a strong thermalization of charm quarks in the medium, our approach is focused not only on the suppression phenomenon but also on the physical evolution of those correlations, including an original treatment of their diffusion in the QGP due to their Compton scattering with gluons and the implications of such a diffusion on J/ψ energy loss and collectivity, studied in a hydrodynamic transport model. The general tendency of our results indeed shows that elastic processes may have a non-negligible influence on the quarkonia propagation in the QGP.

In our contribution, we will discuss the theoretical framework we have developed to evaluate the elastic cross section of J/ψ's (and more generally
$Q\bar{Q}$ correlations) by combining analytical calculations based on pQCD and results from lQCD. We will then address the quarkonia propagation under the influence of such collisions, treated in a Fokker-Planck approach, and will present results deduced from our transport code MC@SHQ. Those results will be compared to recent STAR and PHENIX experiments at RHIC and predictions of $v_2^{J/\psi}$ for LHC will be shown.

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