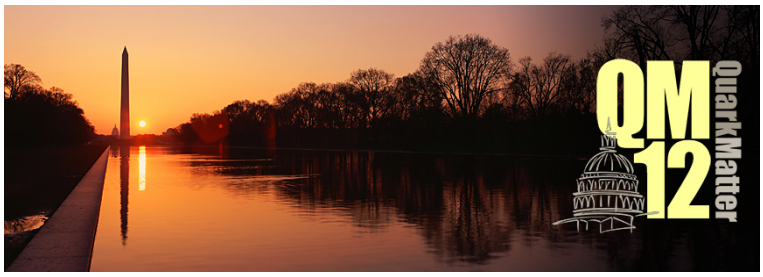

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Heavy quark quenching from RHIC to LHC and the consequences of gluon damping

Friday, 17 August 2012 17:50 (20 minutes)

Recently, we have proposed a microscopic approach for the quenching and thermalisation of heavy quarks (HQ) in URHIC \cite{Gossiaux:2008,Gossiaux:2009,Gossiaux:2010}, assuming that
they interact with light partons through both elastic and radiative processes evaluated by resorting to some parameterization of the running coupling constant, while those partons are spatially distributed along hydrodynamical evolution of the hot medium. This approach is able to explain successfully several observables measured at RHIC, such as the nuclear modification factor and the elliptic flow of non-photonic single electrons. The diffusion coefficient of heavy quarks in the quark gluon plasma – a fundamental property of this state of matter – can thus be extracted and compared with recent lattice calculations. In this contribution, we discuss the predictions of our model for D and B mesons production in URHIC at LHC energies and confront them with experimental results obtained so far by ALICE and CMS collaborations for Pb-Pb collisions at $\sqrt{s} = 2.76$ TeV.

The slight excess of quenching found w.r.t. the D mesons data at LHC trigers our interest in new effects neglected up to now, such as the influence of gluon damping on radiative energy loss and its phenomenological consequences. In \cite{Bluhm:2011}, we have indeed studied the effect of an absorptive medium on standard LPM \cite{LPM} radiation in electrodynamics and have advocated that the large time needed for the photon formation in Bremsstrahlung from ultrarelativistic charges is not affordable if damping is taken into account. Similar effect manifests itself in QCD, as we have recently advocated in \cite{Bluhm_2012}. In our QM contribution, we intend to concentrate on the {\em implications} of such an effect on the quenching of particles in URHIC (discussing observables such as spectra, elliptic flow and azimutal correlations) as well as on the single electron puzzle.

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