Contribution ID: **132** Type: **Oral presentation**

Recent results on heavy quark quenching in ultrarelativistic heavy ions collisions: the effect of gluon damping

Monday, 28 May 2012 17:50 (20 minutes)

Recently, we have proposed a microscopic approach for the quenching and thermalisation of heavy quarks (HQ) in URHIC [1, 2, 3], 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 at Hard Probes, we would like to discuss the predictions of our model [2] 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 .
Jointly, we would like to discuss the question of the influence of a possible gluon damping on the phenomenological consequences of radiative energy loss. In [5], we have indeed studied the effect of an absorptive medium on standard LPM [6] 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 one of us (M. Bluhm) proposes to demonstrate at HP 2012 in another contribution. In our contribution, we would concentrate on the implications of such an effect on the quenching of particles in URHIC, discussing observables such as spectra, elliptic flow, azimutal correlations, as well as the single electron puzzle.

References

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Session Classification: Parallel IIA: Heavy flavour