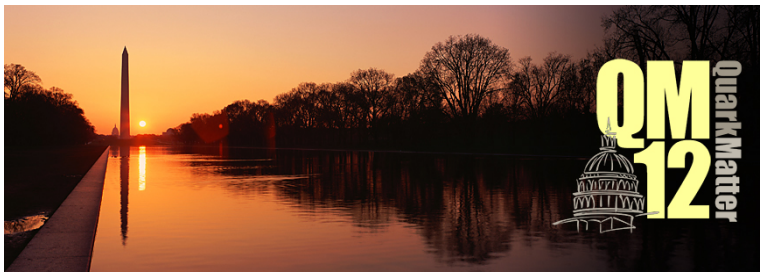

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”Chemical” composition of the Quark-Gluon Plasma in relativistic heavy-ion collisions

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

We study the evolution of the quark-gluon composition of the plasma created in ultra-Relativistic-Heavy Ion Collisions (uRHIC’s) employing a partonic transport theory that includes both elastic and inelastic collisions plus a mean fields dymanics associated to the widely used quasi-particle model. The latter, able to describe lattice QCD thermodynamics, implies a “chemical” equilibrium ratio between quarks and gluons strongly increasing as T -> Tc, the phase transition temperature. Accordingly we see in realistic simulations of uRHIC’s a rapid evolution from a gluon dominated initial state to a quark dominated plasma close to Tc. The quark to gluon ratio can be modified by about a factor of 20 in the bulk of the system and appears to be large also in the high pT region.
We discuss how this aspect, often overflown, can be essential for a quantitative study of several key issues in the QGP physics: shear viscosity, jet quenching, quarkonia suppression. Furthermore a bulk plasma made by more than 80% of quarks plus antiquarks provides a theoretical basis for hadronization via quark coalescence.
Ref. [arXiv:1202.2262]

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