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Describing extreme matter using perturbative QCD - A status report

Shortly after the emergence of RHIC data on heavy ion collisions, there was a backlash against the application of perturbative QCD to heavy ion collisions. This was based on the purported inability of pQCD to properly account for the QCD equation of state, the short thermalization time of the QGP, the smallness of the shear viscosity to entropy density ratio, and the quenching of high energy jets. In the interim some of these issues have been resolved by more detailed consideration of the pQCD processes at play or have been revealed to be “straw men”. In this talk I will review the status of pQCD applications to heavy ion collisions and discuss what issues have been resolved (or partially resolved) and what open issues remain. Finally, I will speculate about how the remaining open issues might be resolved in the future.

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