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Electromagnetic probes of the quark-gluon plasma: perturbation theory meets the lattice

Friday 2 September 2016 15:00 (30 minutes)

In this talk I will review recent efforts in constraining the photon and dilepton rates on the theory side. This is achieved by extending perturbative calculations to next-to-leading order in the coupling g both for photons and for dileptons in most kinematical regions. A polynomial interpolation for the corresponding spectral function, which vanishes at zero frequency and matches to these perturbative results at large invariant masses is employed to analyze continuum-extrapolated lattice results for the vector current correlator at spatial momenta $k \sim (2-6)T$. At vanishing invariant mass we extract the photon rate which for $k \sim 3T$ is found to be close to the NLO weak-coupling prediction. For $k \sim 2T$ uncertainties are large, but the photon rate is likely to fall below the NLO prediction, in accordance with the onset of a strongly interacting behaviour characteristic of the hydrodynamic regime.

Summary

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