Contribution ID: **268** Type: **Talk**

Thermal dilepton rates and electrical conductivity of the QGP

Friday, 17 July 2015 16:50 (20 minutes)

We present new results on the reconstruction of mesonic continuum spectral functions for three temperatures between 1.1Tc and 1.5Tc in quenched QCD. Making use of non-perturbatively improved clover Wilson valence quarks allows for a clean extrapolation of measured correlator data to the continuum. We found that the vector correlation function is almost temperature independent in the current temperature window. For the case of vanishing momentum the vector spectral function is obtained by fitting the data to a well motivated ansatz. The electrical conductivity of the hot medium, related to the slope of the vector spectral function, is computed from the resulting parameters leading to a temperature independent estimate for all three temperatures. The dilepton rates resulting from the obtained spectral functions are compared to a perturbative expression, obtained by combining the results of different computations in different frequency regimes. Our results qualitatively yield a larger rate in the intermediate frequency regime, and also show no significant temperature dependence. The continuum extrapolated transversally and longitudinally polarized correlation functions at different momenta are compared to the corresponding perturbative expressions.

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Session Classification: Nonzero Temperature and Density

Track Classification: Nonzero Temperature and Density