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Exact sum rules for vector channel at finite temperature and their application to lattice QCD analysis

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We derive three exact sum rules for the spectral function of the electromagnetic current channel at finite temperature, by using operator product expansion and hydrodynamics, focusing on zero spatial momentum case. We also discuss the possibility to use these sum rules to constrain and improve the functional form of the spectral function assumed in the lattice QCD analysis, and to evaluate the transport efficient at the second order, which does not directly appear in the spectral function, from the lattice QCD data.

Summary

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