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Typ: Talk

Thermal photon production rate from Transverse-Longitudinal(T-L) mesonic correlator on the lattice.

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Thermal photons are vital tool to study Quark-Gluon Plasma The photon production rate from the plasma at some temperature T is proportional to the transverse spectral function $\rho_T(\omega = |\vec{k}|, \vec{k})$. One can calculate the photon production rate also from the difference between $\rho_T(\omega, \vec{k})$ (transverse) and $\rho_L(\omega, \vec{k})$ (longitudinal) correlator as ρ_L vanishes at the light cone. The UV part of $\rho_T - \rho_L$ is suppressed; therefore, the corresponding Euclidean correlator receives most of its contribution from the IR part of $\rho_T - \rho_L$. We also calculate the T-L correlator on $N_f = 2 + 1$ flavor HISQ configurations with $m_l = m_s/5$ at temperature $\sim 1.15T_c$ and $1.3 T_c$. We have used two ansätze of the spectral function, which are 1) Polynomial ansatz of the spectral function connected to the UV region compatible with OPE expansion and 2) Hydro-inspired spectral function. We have also used the Backus-Gilbert method to estimate the spectral function. We will compare the photon production rate estimated from all these different methods.

Experiment/Theory

Theory/Phenomenology

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