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Cavitation and Thermal Dilepton Production in QGP

We investigate the thermal dilepton production-rates using one dimensional boost-invariant second order relativistic hydrodynamics to find proper time evolution of the energy density and the temperature. We study the \textit{non-ideal} effects arising due to viscosity (both bulk and shear), equation of state ($\epsilon \neq 3P$) and cavitation on thermal dilepton production from QGP at RHIC energies. The effect of bulk-viscosity and non-ideal equation of state are taken into account in a manner consistent with recent lattice QCD estimates. It is shown that the \textit{non-ideal} gas equation of state i.e $\epsilon - 3P \neq 0$ behavior of the expanding plasma, which is important near the phase-transition point, can significantly slow down the hydrodynamic expansion and thereby increase the dilepton production-rates. We calculate the first order corrections to the dilepton production rates due to shear and bulk viscosities. It is shown that ignoring the cavitation can lead to a wrong estimation of the particle spectra. We show that the shear viscosity can enhance the thermal dilepton spectra whereas the bulk viscosity can suppress it. We present the combined effect of bulk and shear viscosities on the dilepton spectra.

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