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Transport coefficients in Polyakov loop quark meson coupling model: a quasiparticle approach

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We compute the transport coefficients, namely, the coefficients of shear and bulk viscosity as well as thermal conductivity for hot and dense matter within the Polyakov loop extended Quark meson coupling model.
The estimation of the transport coefficients is made by solving the Boltzmann kinetic equation in presence of mean fields of chiral as well as Polyakov loop within the relaxation time approximation.
The transition rates are calculated in a manifestly covariant manner to estimate the thermal-averaged cross sections for quark-quark and quark-antiquark scattering as well as meson meson scatterring.
The calculations are performed for finite chemical potential also.
Within the parameters of the model, the ratio of shear viscosity to entropy density has a minimum at the Mott transition temperature. At vanishing chemical potential, the ratio of bulk viscosity to entropy density, on the other hand, shows a peak at the critical temperature but vanishes only asymptotically at very high temperature. The effect of Polyakov loop as well as chiral condensates remain significant even for temperatures beyond the transition temperature. The coefficient of thermal conductivity also shows a minimum at the critical temperature.

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