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Couplings of spin alignment and shear stress tensor for vector mesons

We present a calculation of the spin alignment for unflavored vector mesons in thermalized quark-gluon plasma based on the Kubo formula in linear response theory. This is achieved by expanding the system to the first order of the coupling constant and the spatial gradient. The effect strongly relies on the vector meson's spectral functions which are determined by the interaction and medium properties. The spectral functions are calculated for the one-quark-loop self-energy with meson-quark interaction. The numerical results show that the correction to the spin alignment from the thermal shear tensor is of the order $10^{-4} \sim 10^{-5}$ for the chosen values of quark-meson coupling constant, if the magnitude of thermal shear tensor is 10^{-2}.

Category

Theory

Collaboration (if applicable)

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