## Electric and magnetic susceptibilities of a hot and dense medium of massive fermions

In this work we calculate the electric and magnetic susceptibilities of a hot and dense medium in equilibrium up to order  $\mathcal{O}(\frac{m^4}{T^4}) \mathcal{O}(\frac{m^2}{T^2})$ , respectively. These susceptibilities are associated with  $\mathcal{O}(k^2)$  terms (power corrections) of the photon polarization tensor, which are computed here for a hot and dense medium of fermions with a small but nonzero mass, i.e.,  $0 < m \ll T, \mu$ . Our calculations are performed within the hard thermal loop approximation in the real-time formalism. In the high temperature and small chemical potential limit, our results are compared with previous calculations.

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