Exercises

(1) Derive m_D in the QED case. This corresponds to calculating the hard thermal loop part of the photon polarization.

(2) Discuss the situation $1/r \gg E \gg T \gg m_D$.

(3) Discuss the situation $1/r \gg T \gg E \gg m_D$.

Exercises

(1) Show that at one loop the HTL Lagrangian for static quarks gets contributions only from the gluon polarization.

(2) Show that at leading order the thermal part of the gluon condensate in the weak-coupling regime gives back the Stefan–Boltzmann law:

$$\langle \boldsymbol{E}^a(0) \cdot \boldsymbol{E}^a(0) \rangle_T |_{\text{thermal part}} = (N_c^2 - 1)\, T^4\, \frac{\pi^2}{15} \begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$$

(3) Show that the thermal contribution to the potential induced by the chromoelectric correlator vanishes at leading order.

Exercise

(1) Show that the evolution equations for static quark-antiquark pairs are indeed of the Lindblad form and write the collapse operators.