Ex 8492

This is a variation over 8490, see also 7010.

(1) $H_{int} = -\frac{1}{2}\varepsilon\,\hat{n}$

(2) $\langle n\rangle_\varepsilon = N\,\mathrm{tgh}\left(\frac{\varepsilon}{2T}\right) \approx \frac{N}{2T}\varepsilon$

$$\mathrm{Var}(n) = \frac{N}{[\cosh(\varepsilon/2T)]^2} \approx N$$

(3) $A_\varepsilon = \frac{N}{2T}\gamma\,\varepsilon$

(4) $n_\omega = \frac{N}{2T}\,\frac{\gamma}{\gamma - i\omega}\,\varepsilon_\omega$ (AC version)

$\langle n\rangle = \langle n\rangle_\varepsilon - \left[\frac{N}{2T}\frac{1}{\gamma}\right]\dot{\varepsilon}$ (DC limit)

$$\chi(\omega) = \frac{N}{T}\,\frac{\gamma}{\gamma - i\omega}$$

$$\eta = \frac{N}{T}\,\frac{1}{\gamma}$$

(5) $C(\tau) = N\,e^{-\gamma|\tau|}$

$$\nu = N\,\frac{2}{\gamma}$$

$$\eta = \frac{\nu}{2T}$$