

**Problem#17**

Use Eq.(550) to obtain the Hartree-Fock approximation to the energy of the ground state. Discuss the physical meaning of this result by drawing on the numbers handed out for atomic Helium.

**Problem#18**

First perform the integral

$$-i \int \frac{d\omega'}{2\pi} g^{(0)}(\alpha, \gamma; \omega + \omega') g^{(0)}(\beta, \delta; \omega') \quad (1)$$

and compare the result with the noninteracting polarization propagator. Next consider the graphical analysis of the RPA eigenvalue problem in the case of a separable interaction. What happens with the analysis of the possible eigenvalues when the backward-going terms are neglected? What happens with the transition probability?

We will discuss these problems during the meeting on Monday, November 6, at 3pm. To motivate the preparation for these problems I propose to call on Andy to do #17 and on Jonathan and Qinghai for #18.