

Problem Set 2

1) Consider the problem of electrons interacting with impurities with concentration n_i , assume that the interaction potential is weak and short range. Assume the system is in equilibrium, at a temperature T . a) Evaluate the following self energy functions:

$$\Sigma^t, \Sigma^>, \Sigma^<, \Sigma^A, \Sigma^R, \Sigma^K$$

to second order in perturbation theory in the impurity potential.



Figure 1: Second Order and First Order Self Energies