Physics 167 **Problem Set 3** **Due: Friday, March 25, 2005**

Problem 1

Consider a Si chip with a heat dissipation of 100 W/cm^2. Taking the characteristic lengthscale of a chip to be 1cm, estimate the temperature of the chip (assume that all the heat is taken out due to heat conductivity of Si).

Problem 2

Consider a doble dot system shown in the figure. In this problem we are interested in the linear transport regime when the bias voltage between the source and the drain is zero.

(a) Construct the stability phase diagram as a function of V_{g1} and V_{g2} for $C_m = 0$.

(b)* (Extra credit) Construct the stability phase diagram as a function of V_{g1} and V_{g2} for general C_m.