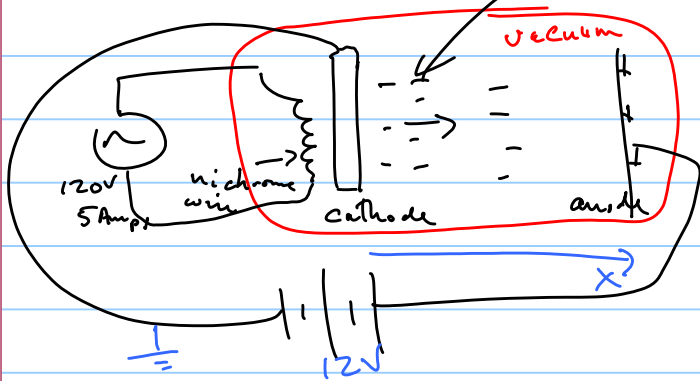


Lecture 35 April 20

Note Title

4/19/2006

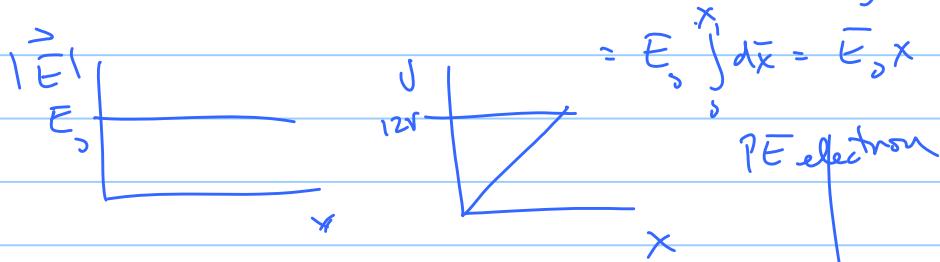
Vacuum diode



assume \approx parallel plate
with spacing small wrt
diameter of plate

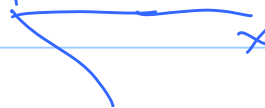
Approx: no space charge

$$\vec{E} = -E_0 \hat{x} \quad V = -\int \vec{E} \cdot d\vec{\ell} = -\int E_0 (-\hat{x}) \cdot dx \hat{x}$$



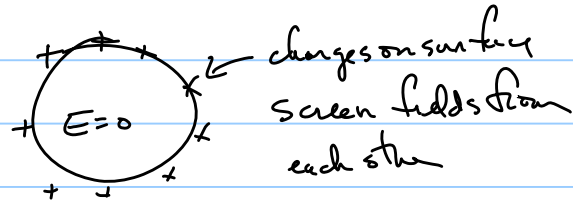
$$PE = qV = -eE_0 x$$

PE electron

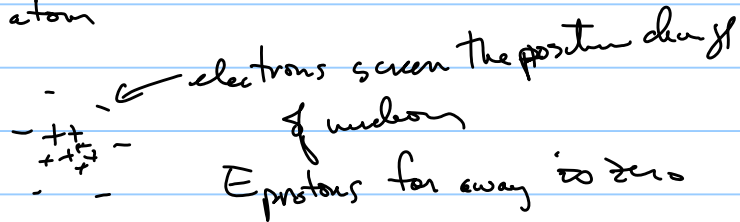


Space charge effects: screening

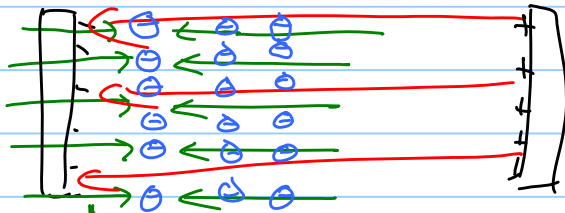
Ex: metal sphere



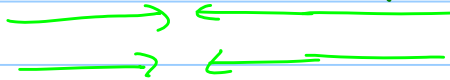
large Z atom



vac. diode



field from 1st sheet of electron filaments to right



near $x=0$ E_{tot} might
be zero

$$\vec{E}_{tot} = E_1 + E_2 + \dots + E_n$$

Possible soln: \vec{E}

