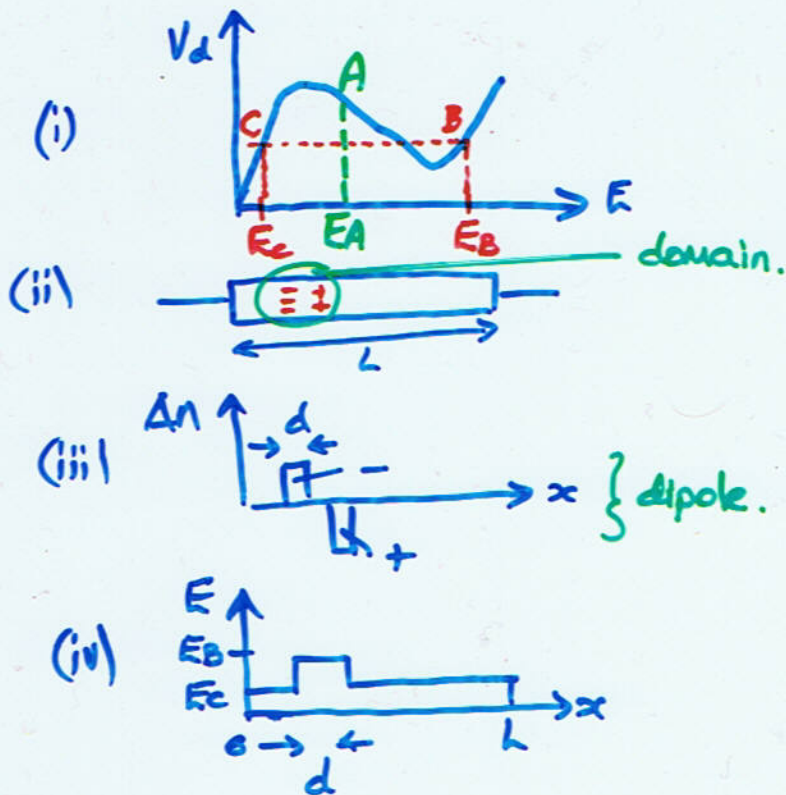


GUNN DIODES ... rely on negative differential resistance.

Consider a length, L , of n -type semiconductor, and apply an electric field E_A , such that E_A is in the NDR region (non-Ohmic).



A small fluctuation in electron concentration near cathode induces a small dipole.

The E -field increases within dipole, and decreases outside to maintain E_A .

If E_A is in the NDR region, then v_d decreases inside dipole, compared to outside



Electrons pile up on left of domain, and drift away on right.

Steady state reached when field inside is E_B and that outside is E_C ... then all electrons drift with same v_d i.e. domain drifts towards anode (no more growth)

When domain reaches anode \rightarrow fluctuation in current.

E -field in semiconductor increases to E_A , and process repeats.