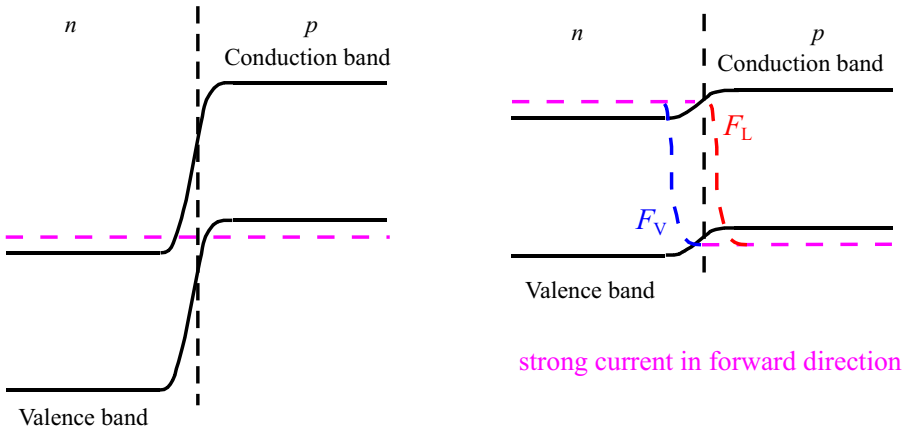
4.5 The injection LASER

In order to reach the inversion state in a semiconductor

$$F_C - F_V > E_G \tag{4.33}$$

we must create a state of extreme non equilibrium.

- The easiest way to do this is a pn junction with a strong bias in forward direction.
- This leads to a strong current through the space charge region which generates the inversion.
- In addition we need extremely high doped material to shift the Fermi energies into the bands itself.



Questions to solid state physics:

- Why do the quasi Fermi energies bend so strongly with current flow?
- e.g. extreme bending in the space charge region, but negligible bending in the bulk. Why?