

# Series – Semiconductor physics and light-matter interaction

Academic year 2025-2026 – 1<sup>st</sup> semester

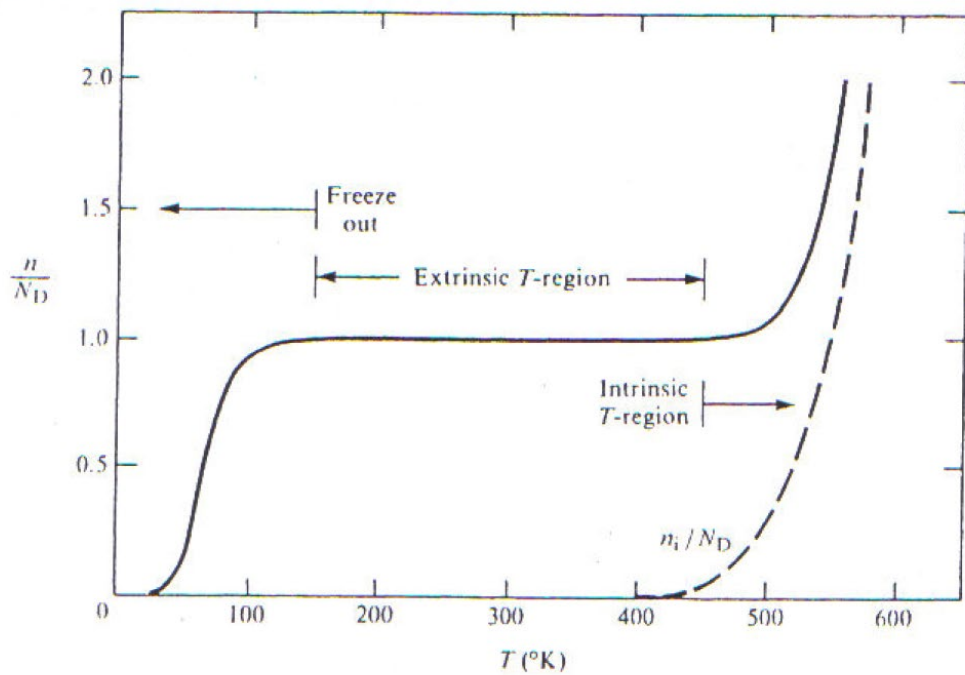
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## EXTRA Series – Graph interpretation

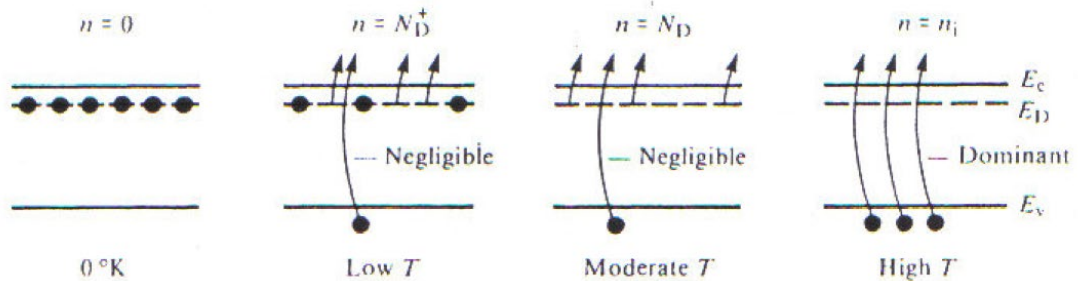
The aim of this series is to analyse and comment on the following figures (subfigures complete each other) using the physical concepts seen in the lectures and the previous series throughout this semester. You should first focus on the main aspects and whenever possible you should then go more deeply into the details of the underlying physics (i.e., describe what seems especially relevant to you as extensively as possible).

### Exercise

#### Figure I



(a)



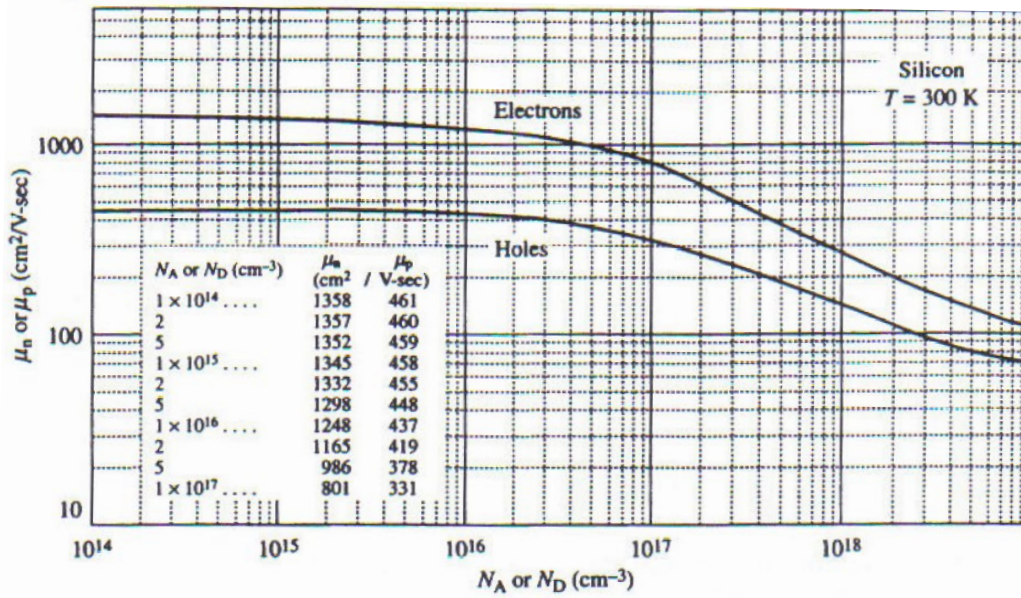
(b)

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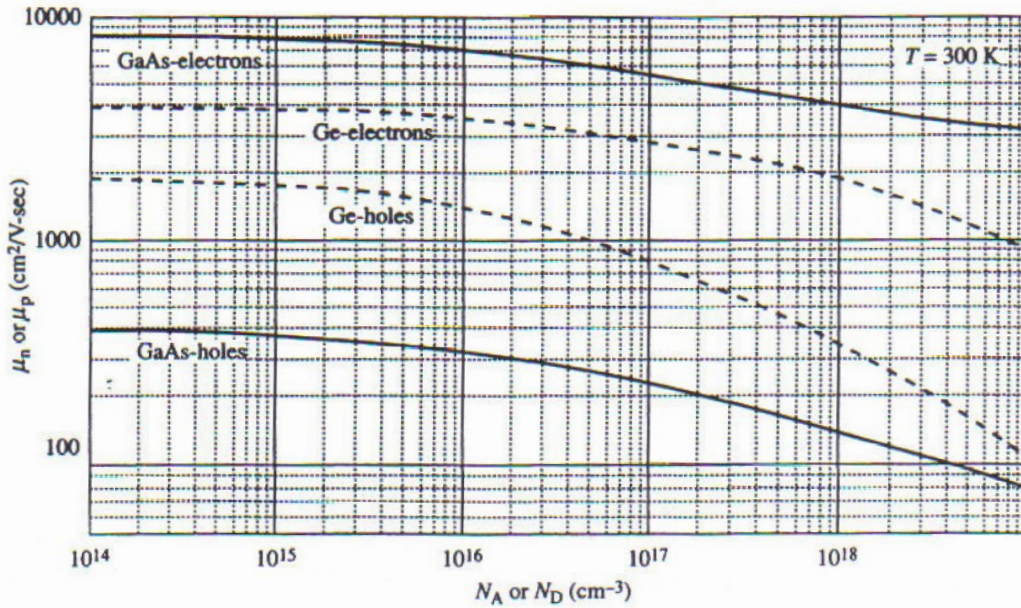
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**Figure II**



(a)



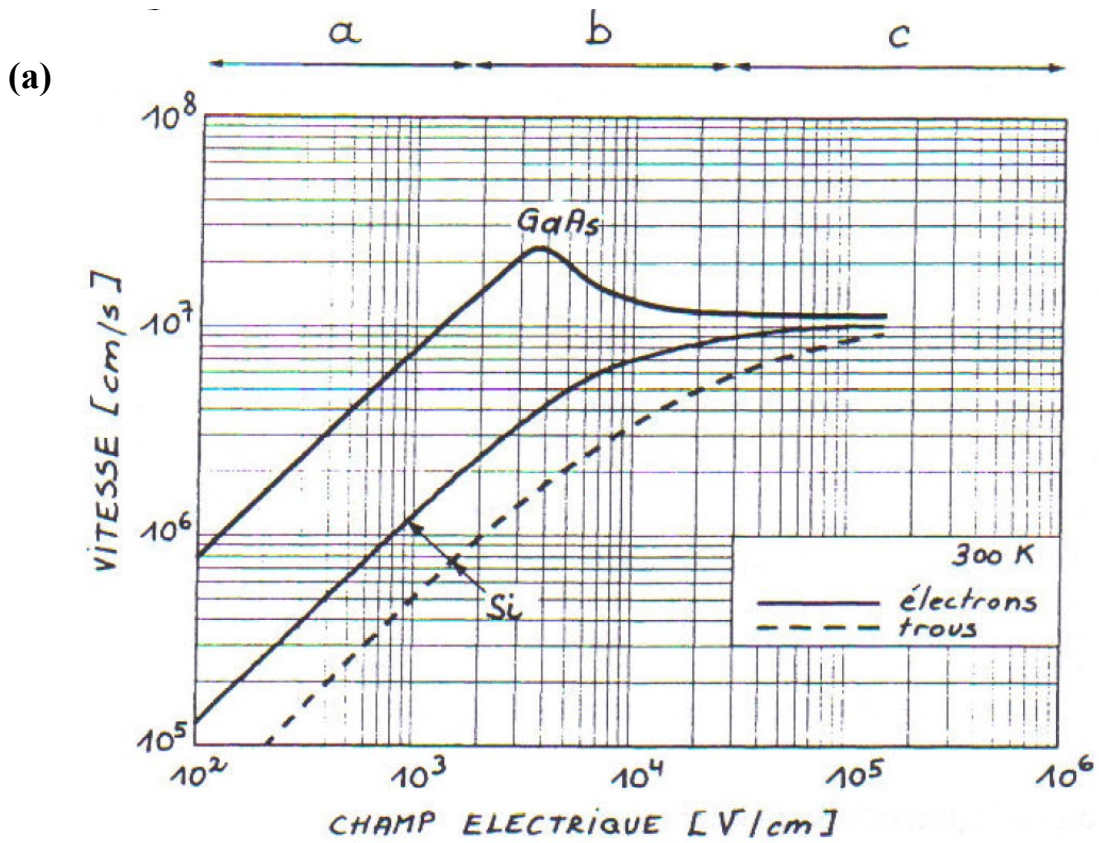
(b)

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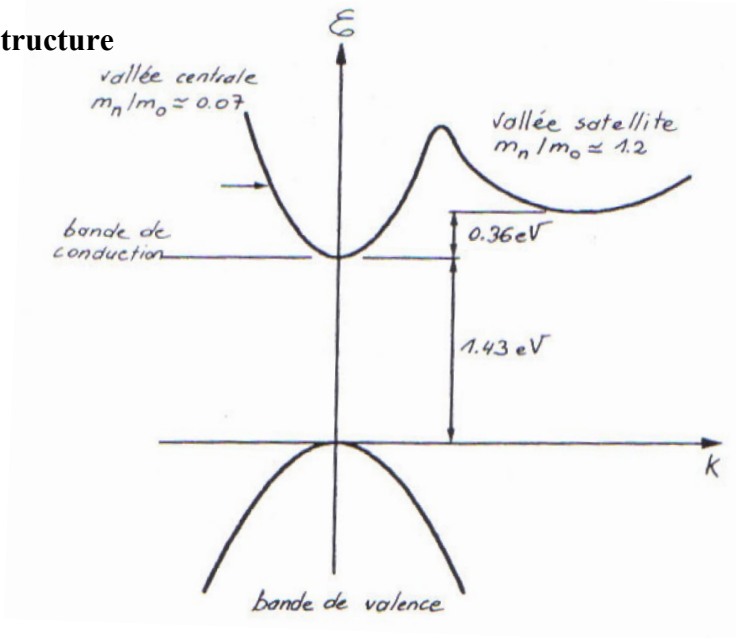
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**Figure III**

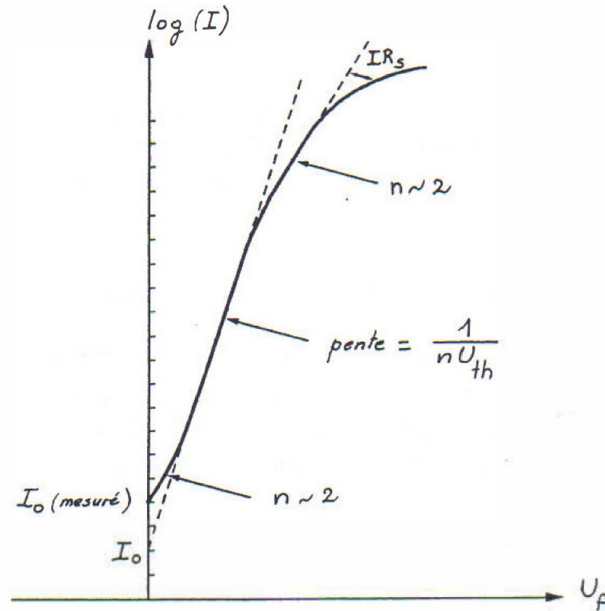


(b) GaAs band structure



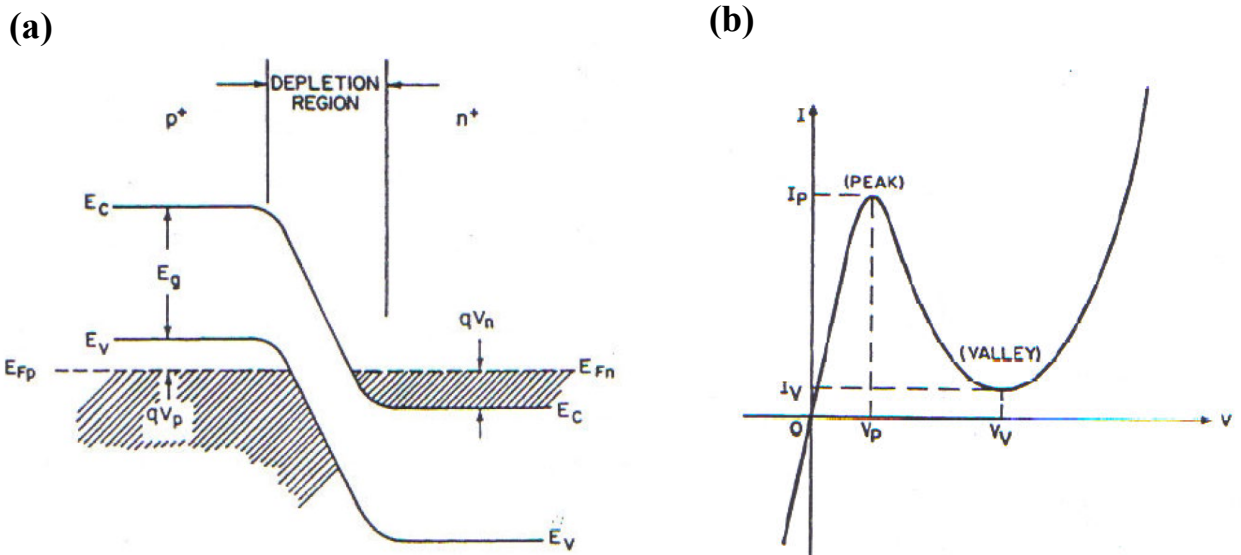
**Figure IV**

**Schematic current-voltage characteristics of a forward biased p-n junction diode**



**Figure V**

**(a) Band diagram of a tunnel diode at thermal equilibrium.  $V_n$  and  $V_p$  correspond to the degeneracy level for the n- and p- type regions, respectively. (b) I-V curve of a tunnel diode and (c) schematic explaining the evolution of the I-V curve.**



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