Semiconductor Devices Notes

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1 Basic Semiconductor Physics

We start with covering the basics of quantum mechanics, and so, mandatorily, I have to type out the Schrodinger Equation(time-independent):

$$-\frac{\hbar^2}{2m}\nabla^2\psi + V(\vec{r})\psi = E\psi \tag{1}$$

An ansatz $\psi(x,t) = A\sin(\omega t - kx)$ has definite momentum $p = \hbar k$ but no definite position (pure sine wave)

An ansatz $\psi(x,t) = \delta(x)$ has definite position $x = 0$ but no definite momentum