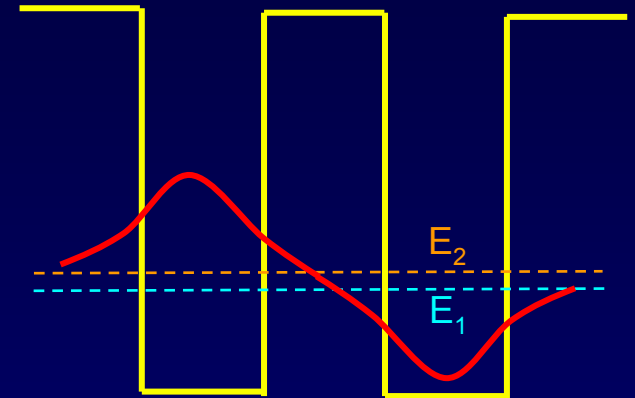


Solution

Consider the double well shown. The two energy levels of interest are $E_1 = 1.123$ eV and $E_2 = 1.124$ eV. At $t = 0$, Ψ is in a superposition that maximizes its probability on the left side.



1) At what time will the probability be maximum on the right side?

The period of oscillation is:

$$T = h/(E_2 - E_1) = 4.135 \times 10^{-15} \text{ eV}\cdot\text{s} / 0.001 \text{ eV} = 4.1 \times 10^{-12} \text{ s}.$$

We want a half period: $T/2 = 2.1 \times 10^{-12} \text{ s} = 2.1 \text{ ps}.$

2) If the barrier is made wider, will the time become larger or smaller?

What about $E_2 - E_1$?