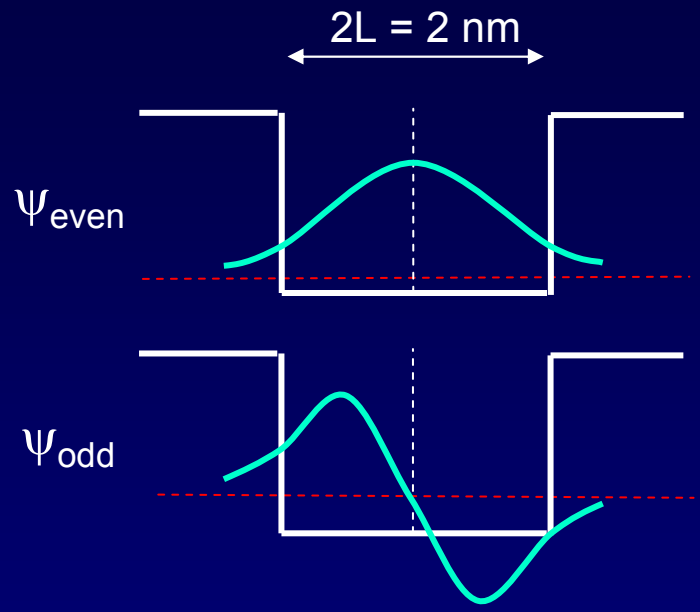
Energy as a Function of Well Separation

When the wells just touch (d = 0, becoming one well) we know the energies:



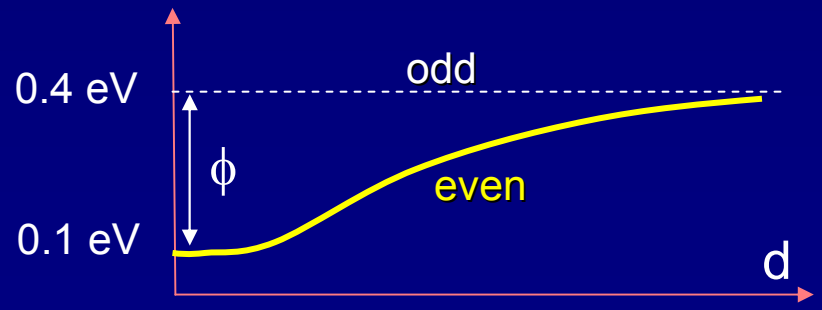
$$E_1 \approx \frac{1.505\ \text{eV}\cdot\text{nm}^2}{(4L)^2} = 0.1\ eV$$

(n = 1 state)

$$E_2 \approx \frac{1.505\ \text{eV}\cdot\text{nm}^2}{(4L)^2}\cdot 2^2 = 0.4\ eV$$

(n = 2 state)

As the wells are brought together, the even state always has lower kinetic energy (smaller curvature, because it spreads out). The odd state stays at about the same energy. The node prevents it from spreading.



Splitting between even and odd states:

$\Delta E = 0.4 - 0.1\ \text{eV} = 0.3\ \text{eV}$