Tunneling and Electric-Field Effects on Electron-Hole Localization in Artificial Molecules//
As a first step, I compute the single-particle eigenfunctions and eigenvalues for electrons and holes within the envelope-function and effective-mass approximations [1]. The external 2 confinement of the carriers in the double dot is described by a prototypical confinement potential, which is double-box-like along z and parabolic in the (x, y)-plane; an additional term in the single-particle Hamiltonian HSP accounts for the electric field F, directed along z:

$$1HSP = \sum \alpha = e, h \int \psi^{\dagger} \alpha(\mathbf{r}) \left[-\frac{\hbar^2}{2m\alpha} \nabla^2 + V^{DW} \alpha(z) ..... \frac{1}{2} m\alpha\omega^2 \alpha(x^2 + y^2) - q\alpha F z \right] \psi\alpha(\mathbf{r}) d(\mathbf{r}).$$

$1X^3/(23) + ...$
$... + 13...(2N–1)X^{2N+1}$.
where