

## Objective:

- Establish control & design parameters for charge qubits
- Determine the range of feasible surface and barrier gate voltages
- Investigate effects of excited states

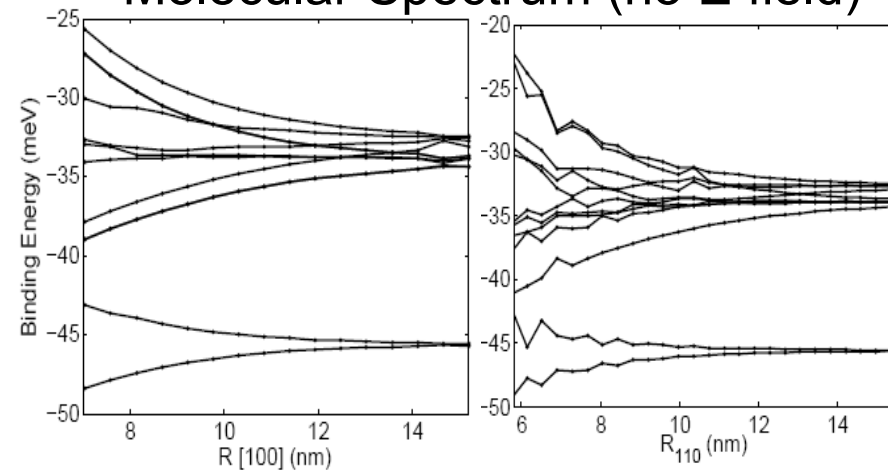
## Approach:

- Surface and Barrier gates modeled by TCAD potentials
- Coupled impurity potential gives rise to molecular states
- Surface gates create left/right localized states

## Results:

- Smooth voltage control is shown for most configurations
- At higher voltages, the excited states mingle with the lowest states, limiting the range of operating voltages.
- Simulation tool for charge qubit experiments & data analysis.

## Molecular Spectrum (no E field)



## Surface gate control of tunnel barrier

