Bandstructure Effects in Si Nanowire Electron Transport

Objective:

- Understand the transport properties of NMOS Si nanowire devices at the ballistic limit
- Investigate bandstructure effects in ultra-scaled Si NMOS nanowires

Approach:

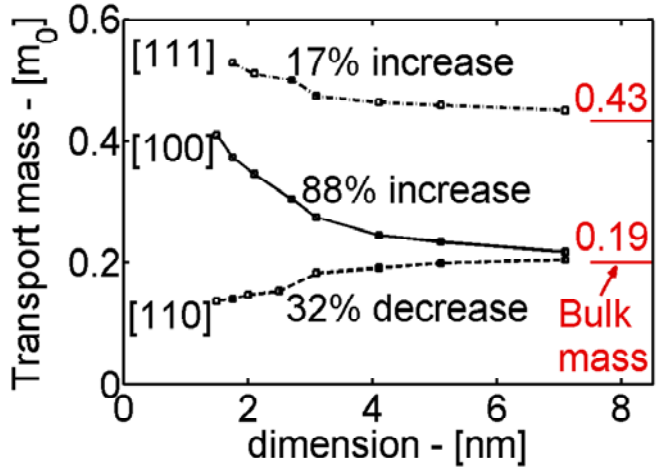
- Use the $sp^3d^5s^*$-SO TB atomistic model for the electronic structure calculation
- Investigate the scaling behavior and transport properties of NWs in various orientations.

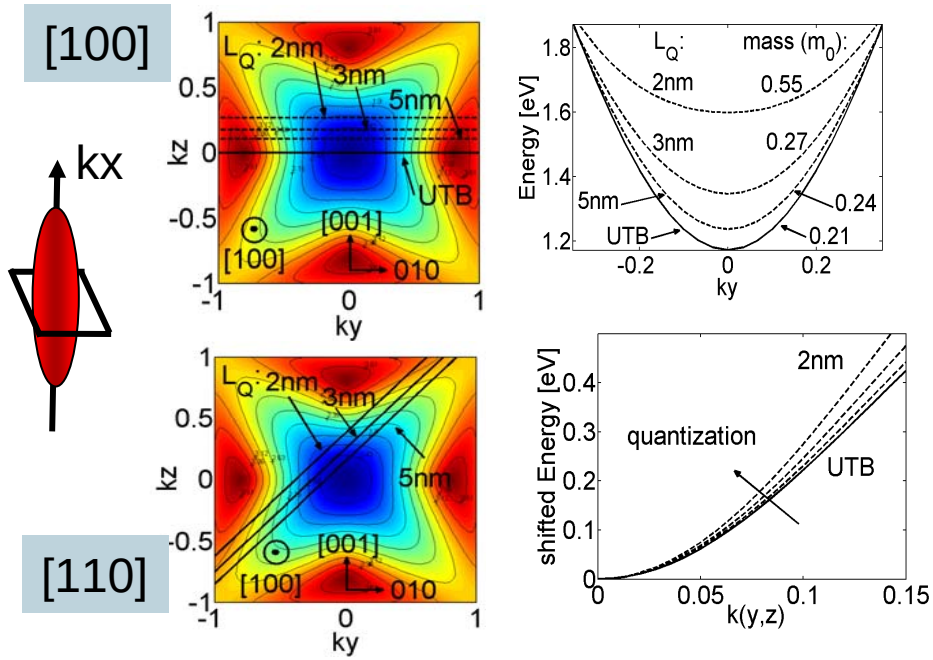
Results:

- The effective mass of the NWs varies as the nanowire is scaled, and varies differently in different orientations
- The anisotropy and non-parabolicity of the electronic structure is responsible for this behavior

Publications:

- Tool at nanoHUB.org Band Structure Lab
- IEEE TED [J100]





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