

Objective:

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

Approach:

- Use the $sp^3d^5s^*$ -SO TB atomistic model for the electronic structure calculation, self consistently coupled to a 2D Poisson
- Use a semi-classical ballistic model for transport

Results:

- Dispersions are different in different orientations and strongly bias dependent
- The charge placement profile is different in different oriented wires
- The capacitance of the wires and the total amount of charge is very similar
- Velocities depend on orientation and dominate the current differences

Publications:

- Tool at nanoHUB.org Band Structure Lab
- IEEE Nano [J109]

