

Objective

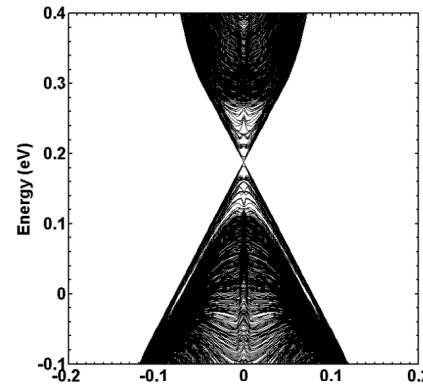
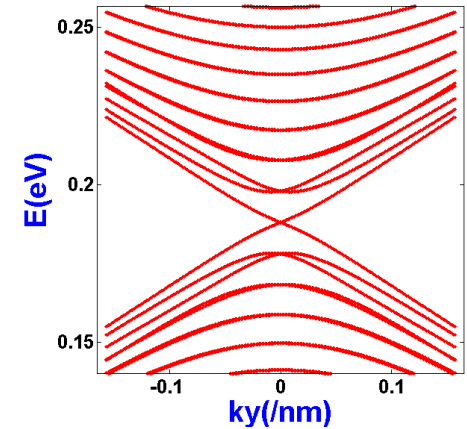
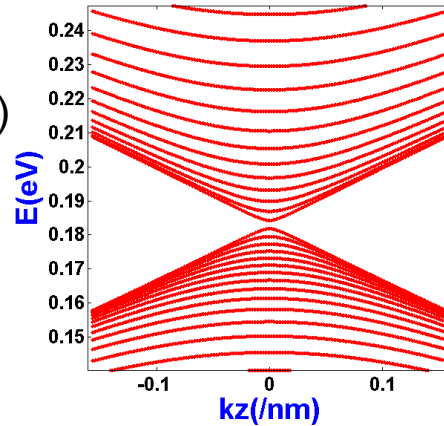
- Gain understanding of surface states (SS) on cylindrical topological insulator (TI) nanowires
- Influence of B-field on SS dispersion
- Study A-B oscillations on TI nanowires

Method

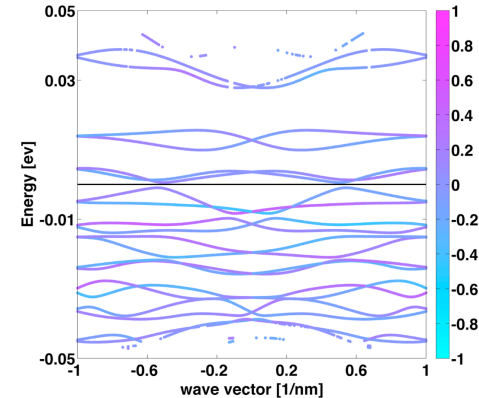
- 20-band tight binding and 4-band k.p Hamiltonian
- B-field implemented with the Peierls phase and Peierls substitution for TB and k.p respectively

Results

- Diameter of TI nanowires must be more than 30 nm to observe SS
- Wires grown along z-axis do not have TI states
- Wires grown along z-axis show band-gap closing under half magnetic flux quantum



Band-gap closing under half-magnetic flux quantum



Small diameter nanowires lead to surface volume hybridization → No TI states found

Impact

- Work on TI nanowires is currently in progress : More details soon!