

Spin Switching in Single Wall Carbon Nanotubes Quantized Conduction Resolved

Objective:

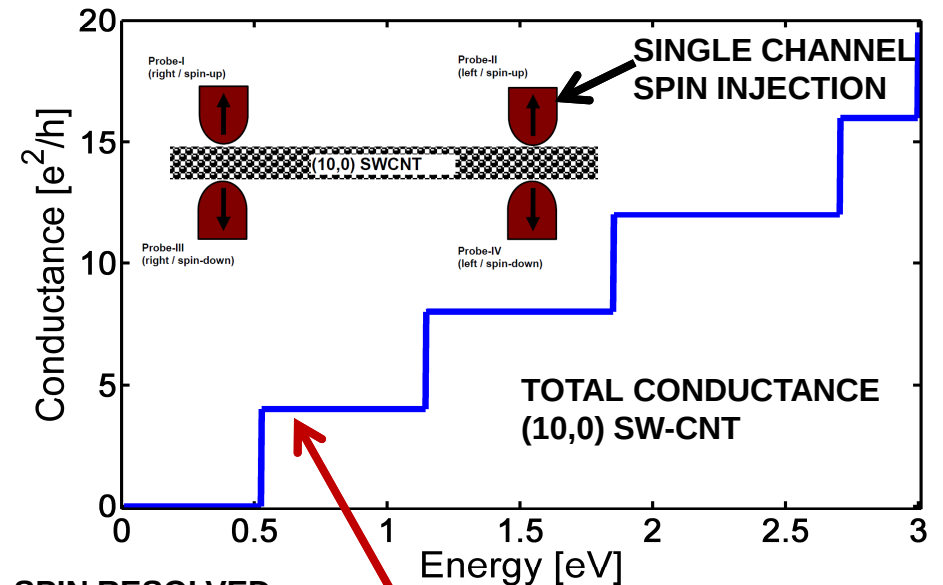
- Long coherence lengths in SWCNTs offer unique opportunities for spintronics
- Use spin-orbit coupling for spin manipulation

Approach:

- Large scale bottom up modeling using atomic orbitals
 - up to 20 μm in length SWCNT (10,0)
 - more than 3 million atomic orbitals
- A Rapid-Recursive Greens Function (RGF) algorithm is developed

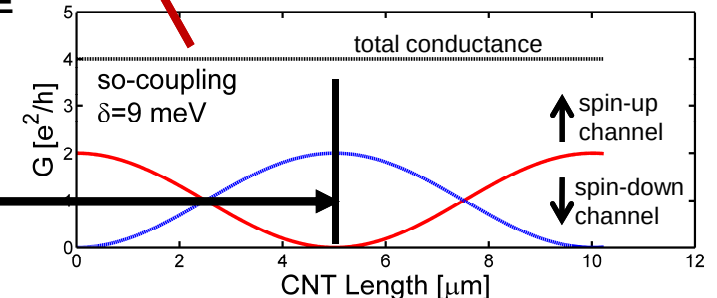
Impact:

- Demonstrated spin control and switching due to spin-orbit coupling effects
- Strongly energy dependent
 - 100% spin modulation (switching)
 - predicted at quantized conduction limit



SPIN RESOLVED CONDUCTANCE

100% Spin Modulation (1st plateau)



Mode Mixing (2nd plateau)

