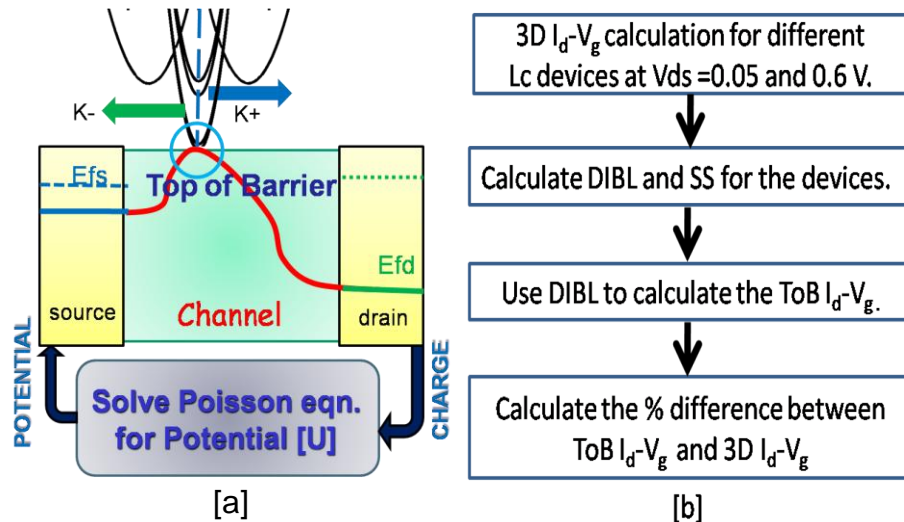


Validity of the Top of the Barrier model for Quantum Transport in Nanowire MOSFETs.

Objective:

- Find valid device regime for Top of the barrier (ToB) model.
- Determine the factors that decide this regime.

Approach :

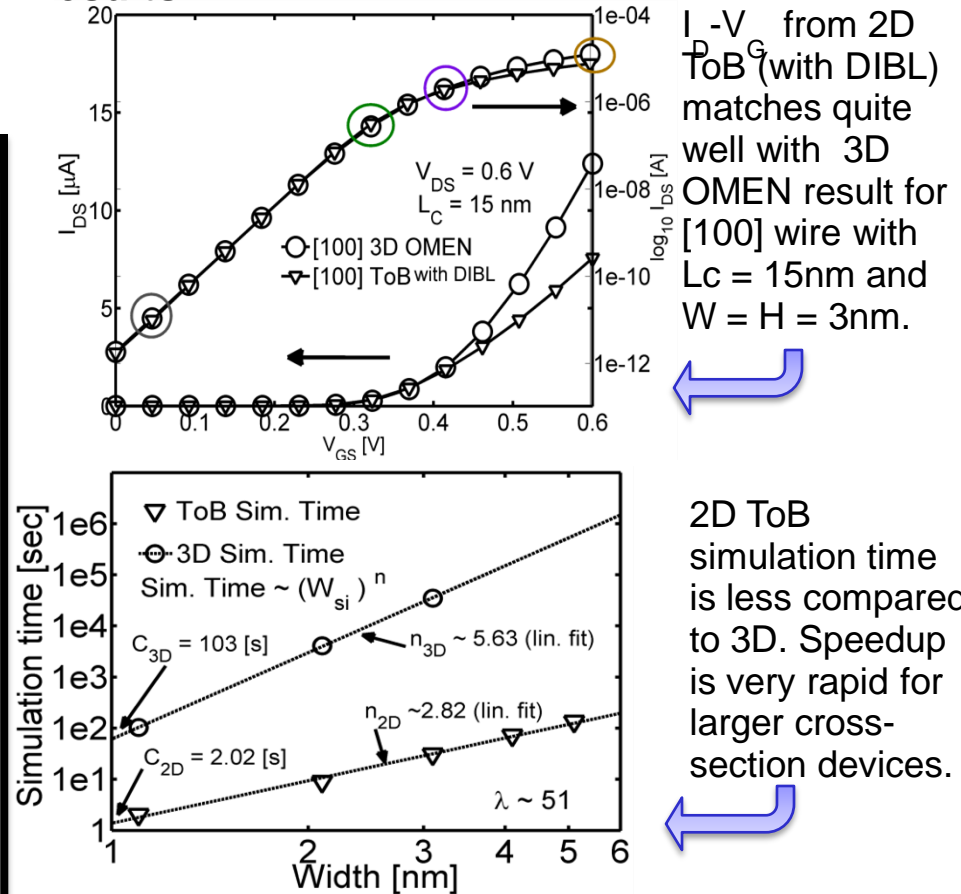


(a) Self-consistency. (b) Flowchart of procedure

Impact:

- 2D ToB a very reliable device model :
 - ✓ For longer channel length device.
 - ✓ Less compute time and lower memory requirements compared to 3D model.
- Results presented in *IWCE, 2009 [P109]*.

Results:



- 2 conditions must when ToB matches 3D :
 - Presence of source-channel barrier ($>KT$)
 - Very less S/D tunneling \Rightarrow long L_c devices
- $L_c \geq (5 \cdot \text{wire diameter})$ good device regime for ToB model.