High-Performance Complementary III-V TFETs With Strain Engineering*

Problem:

- *III-V TFETs have low ON current*
- *III-V p-type TFETs are even worse*

Objective:

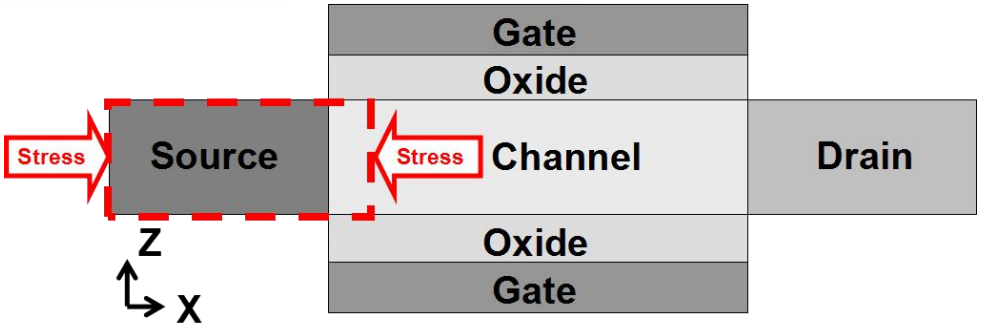
- *Can strain improve III-V TFETs based on UTB structures?*
- *Can strain also improve pTFETs?*

Approach:

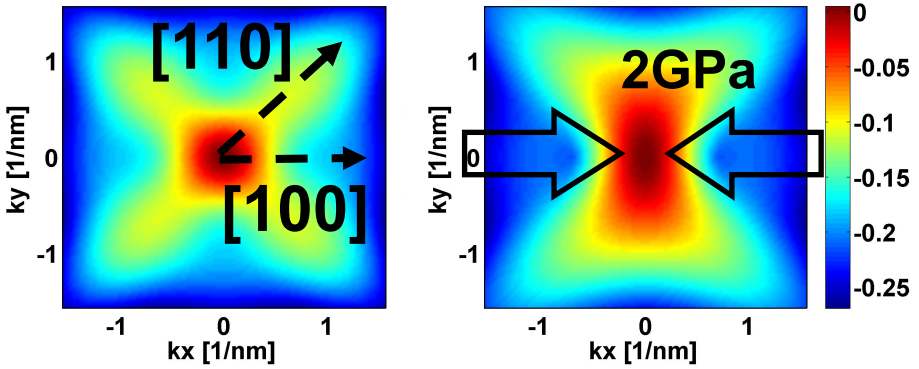
- *Eight-band k · p method with strain*
- *Quantum transport with QTBM*

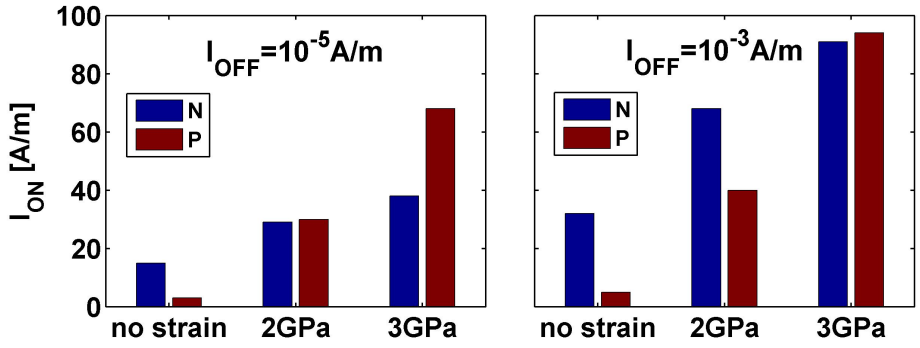
Results / Impact:

- *Uniaxial compressive strain shrinks the band gap and reduces (increases) transport (transverse) effective mass*
- *ON current of p-type InAs UTB TFETs is improved more than n-type.*



Valence band





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*J. Z. Huang *et al.*, preprint: arXiv:1605.00955, 2016.