Objective:

- Previous theoretical models for T_2 do not agree with experimental results, as they ignore BIA effects.
- We want to determine the SIA α and BIA β coupling parameters

Approach:

- Using NEMO-3D we compute the splitting of the lowest valleys due to SOC as a function of in-plane k
- We get α and β as a function of:
  - QW width, L
  - Electric field E_z

Impact:

- SOC determines T_2 and T_1, essential for quantum computation.
- Atomistic approach is essential for the interfaces: first time α and β computed using this method
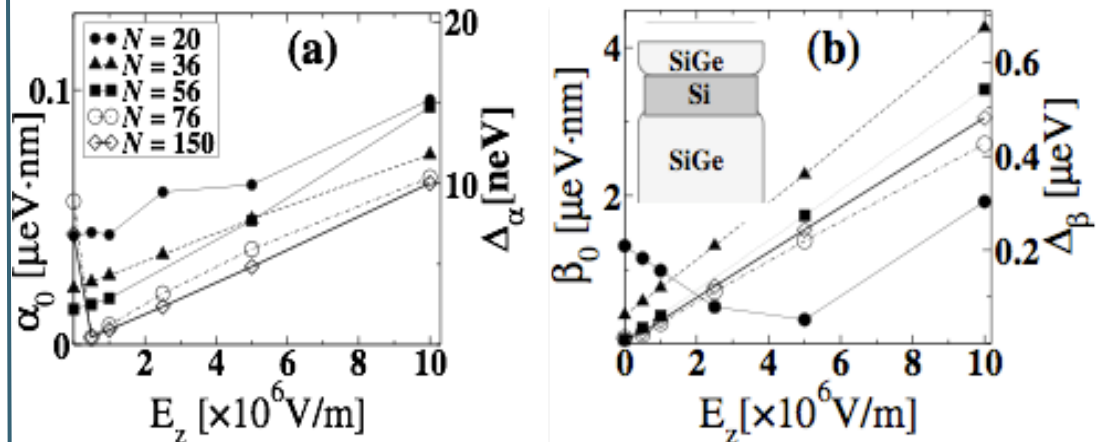
Result:

- Surprisingly, $\alpha \ll \beta$
- SOC has inter- and intra-valley contributions
- α and β linear in k, E_z and are sample dependent
- Two regimes as a function of E_z:
  - *Weak Field, α and β decrease with L*
  - *Strong Field: α and β independent of L*

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