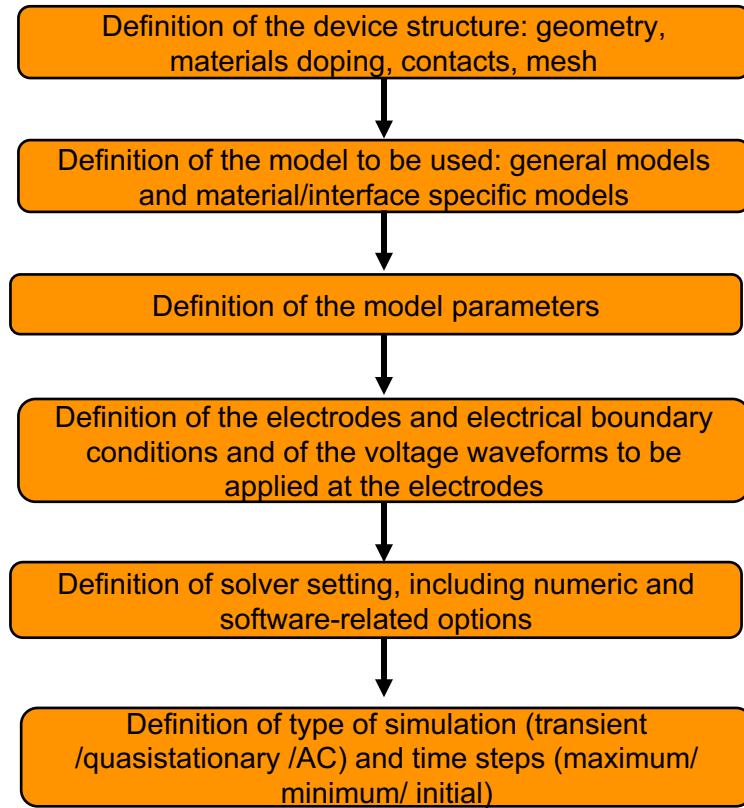


TCAD workflow for simulation of FeFET



TCAD setup used in the simulations discussed in the paper*

❖ Models:

- ❑ Polysilicon:
 - Drift-diffusion model
 - Fermi-Dirac statistics
 - Shockley–Read–Hall recombination, including doping and temperature dependence
 - Mobility (due to phonon scattering, i.e. temperature dependent) and its doping-dependent degradation
 - Nonlocal path band to band tunneling model
- ❑ HZO
 - Ferroelectric model based on Ginzburg–Landau–Khalatnikov framework
 - Phenomenological Landau-Ginzburg-Devonshire expression for the free energy term
- ❑ Interface at polysilicon and $\text{SiO}_2/\text{Al}_2\text{O}_3$
 - Direct tunneling model
 - In particular, it is a quantum-mechanical tunneling model that encompasses both the direct tunneling and the Fowler-Nordheim tunneling regime, based on A. Schenk and G. Heiser, J. Appl. Phys., vol. 81, no. 12, pp. 7900–7908, Jun. 1997, doi: 10.1063/1.365364
- ❑ Schottky barrier between polysilicon and NiSi
 - Thermionic emission model
 - Nonlocal tunneling model (through the Schottky barrier), with a WKB-based model for the tunneling probability

❖ Model parameters (different from default ones) have been extracted by model calibration to experimental data. More details and values of model parameters are reported in other datasets, accessible here [10.5281/zenodo.17048139](https://zenodo.org/record/17048139) and here [10.5281/zenodo.17048240](https://zenodo.org/record/17048240)

❖ Solver: Transient simulations: Backward Euler method, linear solver: blocked decomposition solver «Blocked», inner method for block-decomposition methods: ParDiSo (Parallel, supernodal direct solver)

