

MOSFET Models for Circuit Simulation

First Generation Models

Level 1 -

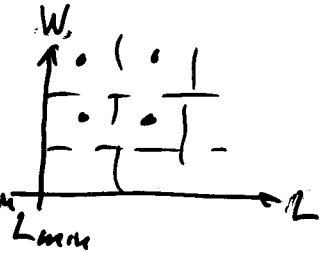
- Basic square law model (Sah model)
- Good model for hand analysis

Level 2 -

- First attempt to include small-geometry effect.
- Developing ground for better models
(Discontinuous between the subthreshold model and strong inversion)

Level 3 -

- Semi-empirical approach
- DIBL, lateral field, binning, W_{min}
- More efficient than Level 2



Second Generation Models

BSIM (Berkeley Short-channel IGFET Model)

- Emphasized mathematical conditioning
- Continuous subthreshold model

HSPICE (Level 2B) -

- Extensively modified BSIM
- Proprietary to HSPICE

BSIM2 -

- Improved version of BSIM (2-dimension, new subthreshold model, etc.)
- Better analog model (output conductance)



Third Generation Models

BSIM3

- Industry standard for DSM technology

MOS Model 9 - Philips Lab.

EKV - fresh approach, good analog