MOSFET Models for Circuit Simulation

First Generation Model

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 model
  (Discontinuous between the subthreshold model and strong inversion)

Level 3 -
- Semi-empirical approach
- D18A, lateral field, binning
- More efficient than Level 2

Second Generation Models

BSIM (Berkeley Short-channel IGFET Model)
- Emphasized mathematical conditioning
- Continuous subthreshold model

HPSICE (Level 2b) -
- Extensively modified BSIM
- Proprietary to HPSICE

BSIM2 -
- Improved version of BSIM (2-dimensional, 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