

Jordan University of Science and Technology

Accurate Modeling for CMOS Inverter Overshooting time in Nanoscale Paradigm

Authors: Nedal R. Al-Taradeh, Abdoul Rjoub, and Mamoun F. Al-Mistarihi

Abstract: In this paper, a new accurate and low delay leakage current (IL) model for complementary metal oxide semiconductor (CMOS) inverter is presented. During the overshooting period, the input-to-output coupling capacitance (CM) influence has been modeled regarding the short channel effect (SCE). Polynomial approximation is used to simplify and accelerate the model with very good accuracy. The time conditions for overshooting region (t_{ov}) are also derived regarding leakage current and coupling capacitance influence. Performance evaluation of the proposed model is compared with simulated results of the BSIM4 level 54 model using HSPICE with very good agreement.