

Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Parameter identification procedure for the Density-Gradient model¹ PETRU ANDREI, Florida State University — The existing methods for the computation of parameters of the Density-Gradient model [M. G. Ancona et al, *Phys. Rev. B* **39**, 9536 (1989)] are based on the comparison of the model with one-dimensional Poisson-Schrödinger computations. While this approach gives good results for devices in which the carriers are confined in only one direction, it is not appropriate for devices in which the carriers are confined in more than one direction. Such devices include short-channel MOSFET and SOI devices, FinFETs, etc. In this presentation we propose a new identification technique based on the effective-mass Schrödinger equation. Our identification technique can be easily applied to 2- and 3-dimensional semiconductor systems. The model parameters are found by using the electron and hole concentrations computed in the framework of the effective-mass Schrödinger equation. Special attention is paid to the computation of the electron effective mass entering in the Density-Gradient equations since these equations are widely used in n-channel nanoscale transistor simulations.

¹This work is supported by the Army High Performance Computing Research Center under agreement number DAAD19-01-2-0014.

Petru Andrei
Florida State University

Date submitted: 29 Nov 2005

Electronic form version 1.4