ICM 1998, Berlin, Aug. 18–27

Abstracts of Short Communications and Posters

Section:

11. Mathematical Physics

1991 MS Classification: 35, 47
Rehberg, Joachim and Kaiser, Hans–Christoph, WIAS Berlin, Germany:
A hybrid semiconductor device model including nanostructures.
While modelling the electronic behaviour of semiconductor devices which include nanostructures one is confronted with the necessity of regarding a hierarchy of models: quantum mechanical models are far too complex as to be calculated for the whole device and drift–diffusion models do not describe nano–substructures adequately. A compromise are hybrid models. Then a serious question is how to fit the different models together. The main difficulty in doing so is the following: even if one regards the quantum substructure as an open quantum system (including a Hamiltonian with non–real potential and non–symmetric boundary conditions) the quantum mechanical current turns out to be zero what definitely prevents current continuity. On the poster we discuss this dilemma and a possible way out.