Abstracts

Physics-Based Electron Device Modelling and Computer-Aided MMIC Design

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The paper provides an overview on the state of the art and future trends in physics-based electron device modelling for the computer-aided design of monolithic microwave IC. After a review of the main physics-based approaches to microwave modelling, special emphasisis placed on innovative developments relevant to circuit-oriented device performance assessment, such as efficient physics-based noise and parametric sensitivity analysis. The use of state-of-the-art physics-based analytical or numerical models for circuit analysis is discussed, with particular attention to the role of intermediate behavioral models in linking multidimensional device simulators with circuit analysis tools. Finally, the model requirements for yield-driven MMIC design are discussed, with the aim of pointing out the advantages of physics-based statistical device modelling; the possible use of computationally efficient approaches based on device sensitivity analysis for yield optimization is also considered.

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