Advances and Developments of Domain Decomposition Methods for Circuit Simulations

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Abstract

Standard methods for solving systems of ODEs can become inefficient for the very large systems obtained in circuit simulations. This is due to the fact that in applying traditional methods directly, the same method and step-size needs to be used for every differential equation in the system, which implies an identical discretization, and this identical discretization must be fine enough to represent all components accurately, including both the rapidly and slowly changing state variables in the system. This can be expensive in terms of the computing time, storage and memory requirement. Different approaches have been proposed in the quest for improving the efficiency of numerical techniques, by speeding up the solution of such large systems, and overcoming such drawbacks mentioned above. Waveform relaxation methods are one of those approaches, which were first introduced for solving VLSI circuit simulations [1], and proved to be very efficient and reliable methods. The purpose of this minisymposium is to share latest developments in various domain decomposition techniques applied to different types of circuits and PDEs related to circuits.

References

[1] E. Lelarasmee, A. E. Ruehli, and A. L. Sangiovanni-Vincentelli, The waveform relaxation method for time-domain anaylsis of large-scale integrated circuits, *IEEE Trans. on CAD of Integrated Circuits and Systems,CAD-1,July 1982.*

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