

Matlab Symbolic Circuit Analysis and Simulation Tool Using PSpice Netlist for Circuits Optimization

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Received 05 January 2015; received in revised form 10 February 2015; accepted 16 February 2015

Abstract

This paper presents new Matlab symbolic circuit analysis and simulation (MSCAM) tool that make uses of netlist from PSpice to generate matrices. These matrices can be used to calculate circuit parameters or for optimization. The tool can handle active and passive components such as resistors, capacitors, inductors, operational amplifiers, and transistors. The transistors are converted into small signal analysis and operational amplifiers make use of the small signal analysis which can easily be implemented in a program as explained in the main work. Five examples are used to illustrate the potential of the approach. Results presented are similar when compared to PSpice simulation. This approach can handle larger matrix dimension compared to symbolic circuit analysis tool (SCAM).

Keywords: Matlab simulation, PSpice netlist, small signal analysis, electronic circuits, symbolic circuit analysis.

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