Abstracts

Lumped device modeling with FDTD including packaging effects

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A two-terminal device can be incorporated into FDTD using the Lumped Element FDTD (LE-FDTD) formulation, unfortunately, this method is not able to analyze accurately the packaging effects of the device. This is possible using Lumped Network FDTD (LN-FDTD) - however LN-FDTD requires a complicated pre-calculation for simple devices such as Schottky or varactor diode. Therefore, this paper presents a simple and effective state space approach to incorporate device packaging effects into FDTD algorithm. The new technique is validated by means of experimental measurements of a varactor-tuned patch antenna and the agreement between the predicted and actual responses is shown to be excellent.

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