Abstracts

Convolution-based global simulation technique for millimeter-wave photodetector and photomixer circuits

D.B. Ameen and G.B. Tait. "Convolution-based global simulation technique for millimeter-wave photodetector and photomixer circuits." 2002 Transactions on Microwave Theory and Techniques 50.10 (Oct. 2002 [T-MTT]): 2253-2258.

A fast convolution-based time-domain approach to global photonic-circuit simulation is presented that incorporates a physical device model in the complete detector or mixer circuit. The device used in the demonstration of this technique is a GaAs metal-semiconductor-metal (MSM) photodetector that offers a high response speed for the detection and generation of millimeter waves. Global simulation greatly increases the accuracy in evaluating the complete circuit performance because it accounts for the effects of the millimeter-wave embedding circuit. Device and circuit performance are assessed by calculating optical responsivity and bandwidth. Device-only simulations using GaAs MSMs are compared with global simulations that illustrate the strong interdependence between device and external circuit.

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