عنوان مقاله:

Sensitivity Analysis of a Wideband Backward-wave Directional Coupler Using Neural Network and Monte Carlo Method (RESEARCH NOTE)

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خلاصه مقاله:

In this paper sensitivity analysis of a wideband backward-wave directional coupler due to fabrication imperfections is done using Monte Carlo method. For using this method, a random stochastic process with Gaussian distribution by 0 average and 0.1 standard deviation is added to the different geometrical parameters of the coupler and the frequency response of the coupler is estimated. The applied process must be done several times for converging Monte Carlo method. Therefore, a large number of simulations is reqired for the coupler. This may take a long time if one uses High Frequency Structure Simulator (HFSS) as the simulation software. To decrease the required time of analysis, neural network model of the coupler incnjuction with Mone Carlo is used. Results showed that the bandwidth of the coupler, minimum return loss in passband and minimum isolation in passband won't be change considerably using the sepecified value of random process. The obtained results for a prototype of a backward wave coupler is presented, which confirm the results of the sensitivity analysis.

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