# Abstracts

## Development of knowledge based artificial neural network models for microwave components

Artificial neural networks (ANNs) provide fast and accurate models for microwave modeling, simulation, and optimization. This paper addresses the use of prior knowledge (or existing models) for reducing the complexity of the input/output relationships that an ANN has to learn. This reduction of input/output complexity allows an accurate ANN model to be developed with less training data, which is very advantageous when training data is expensive/time-consuming to obtain, such as with EM simulation. Two simple methods of incorporating prior knowledge into ANN training are demonstrated and compared: the difference method and the prior knowledge input (PKI) method. As an example, a 2-port microstrip via model has been developed by using a closed-form expression for the via's inductance as prior knowledge.

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