

Identification of Parametric Models with Uniform Stability and Passivity Constraints

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The identification of parametric black-box models from impedance, admittance, or scattering samples is an active and promising research field. The inclusion of symbolic parameters, such as geometrical dimensions or material characteristics, is a key feature for a quick design and optimization of complex electric and electromagnetic systems. We present some recently-proposed algorithms for parametric modeling that can preserve the stability and passivity of the model over the whole space of the parameters. These properties guarantee a stable and well-conditioned model behavior in any time- or frequency-domain analysis. Applications to the modeling of passive RF components and high-speed interconnects are presented.