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On the Computation of Eigen Modes for Lossy Monolithic Microwave Integrated Circuits

The scattering matrix describes monolithic microwave integrated circuits that are connected to transmission lines in terms of their wave modes. The scattering matrix can be computed from the electromagnetic field using a finite-volume method for Maxwellian equations in the frequency domain. Adsorbing boundary conditions can be taken into account for free-space simulation. The numerical solution is treated for lossy structures. As a first step one has to calculate the field distribution on the transmission lines using an eigenvalue problem for non-Hermitian matrices. We show that one can avoid the computation of all eigenvalues to find the few required propagation constants using an iterative method which has to be carried out twice.