Abstracts

Coupled electromagnetic/nonlinear optimization of self-oscillating microstrip antennas with far-field performance specifications

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The broadband design of self-oscillating microstrip antennas by direct numerical optimization based on electromagnetic (EM) simulation coupled with harmonic-balance (HB) analysis is demonstrated for the first time. The design goals are formulated in terms of far-field performance such as radiation intensity and cross-polarization suppression. The optimization problem is transformed into a system-solving problem, and the solution is found by a Newton iteration globalized by a trust-region method. This results in an order-of-magnitude reduction In the number of expensive EM analyses that are required to achieve convergence.

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