Abstracts

Transient Analysis of Multiple-Tuned Injection-Locked Amplifiers with Modulated Input Signal

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A method for the dynamical investigation of reflection-type injection-locked amplifiers (ILA's) driven by modulated input signals is presented. Its distinctive feature is to cover the large-signal analysis of high-order ILA's, which allows the exploitation of broad-banding multiresonant structures. Small-parameter, stroboscopic, and congruence algebra techniques are combined in order to permit the calculation of output voltage transients directly in terms of amplitude and phase of the complex envelope, thus limiting the computational time required in CAD applications. Further, owing to the employed black-box (scattering matrix) description of the tank and coupling two-port, both linear and nonlinear subsystem identification can be performed in terms of measured data. As an example of the application of the method, a fourth-order lLA is analyzed, and results pertaining to BPSK modulated input signals are presented.

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