

Low-Noise Techniques [From the Guest Editors' Desk]

*Original*

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The focused issue we present here is sponsored by the MTT-11 Technical Committee on Low-Noise Techniques. Each Technical Committee in the MTT Society is made up of international researchers with a variety of backgrounds and research interests. The Low-Noise Techniques committee changes on a regular basis and brings in researchers with new interests. Low-Noise Techniques covers everything from fundamental noise sources down to the quantum level and up to complete systems. Of course, nonlinear processes, semiconductor devices and oscillator noise sources are also covered, as you will see in the papers in this issue. The goal of an MTT technical committee is to promote workshops, educational publications and maintain an ever-improving knowledge base for the society in a specific area.

We decided to focus the attention on three different and interesting aspects of the low-noise area, each chosen for the intrinsic complexity coupled to the widespread interest for the Microwave Engineer. The first contribution, by M. Bonnin *et al.*, aims at introducing the most recent approaches to one of the oldest, yet still active, areas of noise-related research: fluctuations in oscillators, autonomous nonlinear systems able to sustain a time-periodic signal even in the absence of external stimulations besides a DC energy source. This peculiar property has far reaching consequence on the oscillator signal, both in terms of phase and amplitude noise. The second contribution, by L. Boggione, provides a step-by-step introduction to the challenges in stationary noise characterization, from the customary case of 2-port devices to the more advanced generalization to  $N$ -port networks. Novel techniques are also discussed aiming at getting rid of the main characterization bottlenecks found in the standard procedures. Finally, noise simulation in nonlinear circuits such as mixers, oscillators, buffer amplifiers, and standard low-noise amplifiers subject to large blocking signals is the topic of the paper by M. Rudolph *et al.* The review focuses on recent implementations, in commercial circuit simulators implementing the Harmonic Balance approach, of device noise models for the nonlinear regime with reference to the major technologies, namely HBTs and FETs.

We are confident that this focused issue, whose contributions are presented by members of the MTT-11 Technical Committee active in the respective research area for several years, will be of interest to both the general reader and to the low-noise specialist to gain insight in these fascinating and practically important topics.

Fabrizio Bonani  
Alfred E. Riddle