"Improving the RF Active Circuit Design Cycle Through Innovations in Electrothermal Modeling, Characterization, and Design Techniques"

by Dr. Charles Baylis

ABSTRACT

In this presentation, ongoing research in the area of RF and microwave active circuits and measurements at the University of South Florida is described. A new quiescent-bias dependent electrothermal modeling technique, developed by the speaker for accurate modeling of thermal and trap effects in microwave FETs, is closely examined. Other present focus areas of research, including the prediction of phase noise in amplifiers and frequency multipliers based on accurate flicker noise modeling, the design of power-amplifier combiners for reduced sidelobes in shipboard radar systems, and the formation of an international collaboration for the development of a high-precision measurement method to measure cell cultures (with the Prague Technical University in Prague, Czech Republic), are also overviewed. Research objectives for upcoming exploration and anticipated future innovations in these areas are discussed.

BIO

Charles Baylis is a Visiting Assistant Professor in the Department of Electrical Engineering at the University of South Florida. He received his B.S.E.E., M.S.E.E., and Ph.D. degrees in Electrical Engineering from the University of South Florida in 2002, 2004, and 2007, respectively. In 2007, he joined the faculty at USF. Dr. Baylis works within the USF Center for Wireless and Microwave Information (WAMI) Systems and directs the RF Active Circuits and Measurements (RACAM) Research Group. His present research interests include RF active circuit design (power amplifiers, oscillators, frequency multipliers, etc.), microwave transistor modeling, mathematical analysis of engineering problems, and biological applications of RF and microwave measurements and technology. He has authored several papers related to his areas of interest. Some of his recent accomplishments include the development of an algorithm to perform more efficient load-pull measurements and devising a method to model trapping effects in microwave FETs based on quiescent operating bias point.