

RF Circuit Design in Nanometer CMOS

2007 International Solid-State Circuits Short Course

With CMOS technology entering the nanometer regime, the design of analog and RF circuits is complicated by low supply voltages, very non-linear (and non-quadratic) devices and large $1/f$ noise. At the same time, circuits are required to operate over increasingly wide bandwidths to implement modern multi-band communication systems as these systems move toward software-defined radio. These trends in technology and system design call for a re-thinking of analog and RF circuit design in nanometer CMOS. Bram Nauta will discuss innovations intended to enable continued progress in spite of these challenges. These innovations include thermal noise canceling, poly-phase distortion canceling and $1/f$ noise reduction techniques applied to basic RF circuits.

Bram Nauta received the M.Sc degree (cum laude) in Electrical Engineering from the University of Twente, Enschede, The Netherlands in 1987. In 1991 he received the Ph.D. degree from the same university on the subject of analog CMOS filters for very high frequencies. In 1991 he joined the Mixed-Signal Circuits and Systems Department of Philips Research, Eindhoven the Netherlands, where he worked on high-speed AD converters. From 1994 to 1998 he led a research group in the same department working on "analog key modules." In 1998 he returned to the University of Twente, as full professor heading the IC Design group, which is part of the CTIT Research Institute. His current research interest is high-speed analog CMOS circuits.