Continuous-Time ADCs in Nanometer CMOS

2007 International Solid-State Circuits Short Course

Due to the ever-increasing data rates of wireless communication systems, the ADCs used require ever-increasing bandwidth. Delta-Sigma (⊗©) ADCs are very popular for applications requiring high-accuracy because their performances are robust with respect to the non-idealities of CMOS technologies. However, because they are usually implemented using switched-capacitor (SC) circuits, their low speeds and aliasing limit their use in telecommunication applications. In addition, ⊗© ADCs require special techniques in nanometer technologies because of the reduced supply voltages available. Therefore, continuous-time (CT) implementations of ⊗© ADCs are being investigated for telecommunication applications. Michel Steyaert will present an overview of the differences between CT and SC ⊗© ADCs and discuss their relative advantages and disadvantages. Jitter issues are important for CT ⊗© ADCs and will be discussed. Low-sensitivity feedback (V_{ref}) techniques will be described and some design case studies for low-voltage nanometer technologies will be studied.

Michiel S.J. Steyaert received his Ph.D. degree in Electronics from the Katholieke Universiteit Leuven in June 1987. In 1988 he was an associated assistant professor at UCLA. In 1989 he joined the ESAT-MICAS group at the Katholieke Universiteit Leuven, were he is now a Full Professor and Chair of the Electrical Engineering department. His current research interests are in analog integrated circuits for high-frequency telecommunication systems and high-performance analog signal processing.