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SEMINAR

Room 118 Civil Engineering

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TRANSMIT DACs FOR MOBILE HANDSETS

by

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Abstract: The presentation will focus on DACs for mobile handsets, one for GSM and one for Low-Chip-Rate Wideband CDMA handsets. If time allows the architecture of a third DAC for standard WCDMA will also be presented. The GSM DAC makes use of a 6-bit quasi-passive pipeplined DAC, and a 4-bit quasi-passive element-mismatch averaged DAC which feeds into a second-order switched-capacitor filter. Some tricks allow us to up-sample the signal if needed. The Low-Chip-Rate WCDMA DAC is comprised of a fully balanced 7-bit dual resistor string DAC with a number of tricks played to help linearize it, and of a 2-bit element-mismatch averaged, non-balanced switched-capacitor DAC. An extra bit is obtained by switching the side of the switch-capacitor DAC imbalance.

The GSM DAC has been shown to be linear to within 1 LSB DNL and to meet all GSM specifications. It is in production in a number of phones, and in a number of design variants. The Low-Chip-Rate WCDMA DAC is in its first round of silicon fabrication right now. Preliminary results may be available in mid to late October.

Xavier Haurie obtained his Master's Degree in microelectronics from McGill Univerity in 1996. He then joined Analog Devices as a mixed signal designer in the Wireless department of the Communications Division, designing data converters for mobile handsets. In 2000 he helped start the design-reuse group at Analog Devices, which later became the System Level Integration group. Among other things he built the company's internal IP catalog and helped start the development of hardware auto-generation software based on XML and java. In 2004 he rejoined the RF Wireless Systems Group to work on data converters for 2nd and 3rd generation mobile handsets.