10.1 — 10:20 a.m.  

A self-synchronized RF-interconnect (SSRFI), based on capacitive coupling and peak signal detection, has been successfully demonstrated in 0.18mm CMOS. This SSRFI can be used effectively for vertical interconnects in future 3D IC with small coupling capacitors of 60fF (8x8mm²). This SSRFI is measured with transmission/receiving PRBS data rate of 3Gbit/s and 1.2x10^-10 BER. The measured rms jitter value is 1.28ps. The core circuit burns about 4mW from a 1.8V supply and occupies 0.02mm² chip area.

10.2 — 10:45 a.m.  

A 90-nm SOI CMOS SoC integrates high-performance FETs with 243-GHz F_t, 208-GHz F_{max}, 1.45-mS/um gm, and sub 1.1-dB NF_{min} up to 26-GHz. Inductor Q of 20, V_{NCP} of 1.8-fF/um², varactor with tuning range as high as 25:1, and low-loss microstrip transmission lines were successfully integrated without extra masks and processing steps. SOI and its low- parasitic junction capacitance enables this high level of performance and will expand the use of CMOS for millimeter-wave applications.

10.3 — 11:10 a.m.  

RF-NMOS with both high f_T (150GHz) and f_{max} (200GHz) presenting a ratio power gain/current gain higher than 1 up to the maximum measurement frequency and a portfolio of high Q passive components have been successfully integrated in a90nm CMOS technology providing a solution for CMOS based RF applications. This achievement is illustrated for the first time by the excellent RF performances in terms of gain, noise figure and power consumption of a 5GHz LNA.

10.4 — 11:35 a.m.  

Relationship between mechanical stress engineering and flicker noise are clarified for the first time using a 50nm level CMOS technology. It is found that enhanced mechanical stress degrades flicker noise characteristics. Trap states and dipoles generated by the stress are considered to be the cause of degradation. It is suggested that the stress engineering is not always the best way to improve transistor performance when considering noise. As a countermeasure, gate dielectric optimization is demonstrated.