

BiCMOS Integration of High Performance SiGe:C HBTs

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Over the last years, SiGe heterojunction bipolar transistors (HBT) have been accepted as a value devices for very-high-data-rate wired and wireless communication systems (e.g. WLAN in the 60 GHz ISM band, automotive radar at 77 GHz). As these systems continue to mature, they create an increasing need for higher integration levels to improve the functionality, to reduce cost and power dissipation. The development of a SiGe:C HBT technology at IHP contributed to a new perspective for SiGe BiCMOS technologies to fulfill this need by providing high integration capability and high performance levels.

Here, we report about the integration of high performance SiGe:C HBT modules into an industry-standard CMOS process. The talk is focused on aspects related to the devices design as well as to the technological implementation of SiGe HBTs. In particular, we demonstrate how simulation and modeling capabilities were used to support the HBT development. Requirements for future simulation tools are discussed in the context of HBT design. This is a joint work with HOLGER RÜCKER (IHP FRANKFURT(ODER)).