This paper introduces a component of the Radio Frequency transceiver called the mixer. The mixer is a critical component in the RF systems, because of its ability for frequency conversion. This passage focuses on the design analysis and simulation of multiple topologies for the active down-conversion mixer. This mixer is characterized by its important design properties which consist of conversion gain, linearity, noise figure, and port isolation. The topologies that are given in this passage range from the most commonly known mixer design, to implemented design techniques that are used to increase the mixers important design properties as the demand of CMOS technology and the overall RF system rises. All mixer topologies were designed and simulated using TSMC 0.18 \textmu m CMOS technology in Advanced Design Systems, a simulator used specifically for RF designs.

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The public is welcome to attend.