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(54) **NON-CASCADING MIMO CHANNEL EXTENDERS FOR RADAR CHIPS**

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(57) **ABSTRACT**

A receive extender in an integrated circuit may include: N phase-adjustment circuits that adjust phases of N receive signals from N receive antennas; and an N:1 demultiplexer that coherently combines the N receive signals into an output signal, which is provided to the transceiver chip. Moreover, a transmit extender in the integrated circuit may include: a 1:M multiplexer that coherently separates a transmit signal from the transceiver chip into M transmit signals, where N and M are non-zero integers that may be different; and M phase-adjustment circuits that adjust phases of the M transmit signals, which are provided to M transmit antennas. Note that the integrated circuit may be coupled to a second integrated circuit that phase shifts the output signal and the transmit signal based at least in part on the oscillator signal. Moreover, control signals between the integrated circuit and the second integrated circuit may be synchronized.