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Photonic Integrated Circuits for mmW Systems

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Abstract— The bandwidth of wireless networks needs to grow exponentially over the next decade, due to an increasingly interconnected and smart environment. By 2020 there will be 50 billion devices connected to the internet. Low-cost, compact and broadband wireless transceivers will be required. The current WiFi frequency bands do not have enough capacity and wireless communication needs to move to the millimeter-wavelength or sub-terahertz range. The use of all-electronic solutions becomes increasingly prohibitive, though, at these higher frequencies. Microwave photonic technology offers the bandwidth and carrier frequencies required for high-capacity wireless networks and remote sensing applications. In this paper, we will introduce our efforts to leverage the advantages of microwave photonics and photonic integrated circuits to develop low-cost and ubiquitous wireless technology enabled by silicon photonics based transceivers.

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