0.4 THz Photonic-Wireless Link With 106 Gb/s Single Channel Bitrate - DTU Orbit (09/12/2018)

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To accommodate the demand of exponentially increased global wireless data traffic, the prospective data rates for wireless communication in the market place will soon reach 100 Gb/s and beyond. In the lab environment, wireless transmission throughput has been elevated to the level of over 100 Gb/s attributed to the development of photonic-assisted millimeter wave and terahertz (THz) technologies. However, most of recent demonstrations with over 100 Gb/s data rates are based on spatial or frequency division multiplexing techniques, resulting in increased system's complexity and energy consumption. Here, we experimentally demonstrate a single channel 0.4 THz photonic-wireless link achieving a net data rate of beyond 100 Gb/s by using a single pair of THz emitter and receiver, without employing any spatial/frequency division multiplexing techniques. The high throughput up to 106 Gb/s within a single THz channel is enabled by combining spectrally efficient modulation format, ultrabroadband THz transceiver and advanced digital signal processing routine. Besides that, our demonstration from system-wide implementation viewpoint also features high transmission stability, and hence shows its great potential to not only decrease the system's complexity, but also meet the requirements of prospective data rates for bandwidth-hungry short-range wireless applications.

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