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Sommario/riassunto	Novel THz device concepts and signal processing schemes are introduced and experimentally confirmed. Record-high data rates are achieved with a simple envelope detector at the receiver. Moreover, a THz communication system using an optoelectronic receiver and a photonic local oscillator is shown for the first time, and a new class of devices for THz transmitters and receivers is investigated which enables a monolithic co-integration of THz components with advanced silicon photonic circuits.