

Millimeter- and terahertz-wave technology for communication and radar/imaging applications by photonics technology

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Abstract

Advanced optical fiber communication technologies enable low-loss and broad-bandwidth transmission in the millimeter-wave and terahertz-wave bands via an optical fiber network. Precise optical modulation techniques can directly generate the millimeter-wave signals, and finally, an optical frequency comb signal generated by the modulation also provides the terahertz-wave signals by optical heterodyning systems. These technologies on the signal generation could be utilized for realization of distributed antenna system in the millimeter- and terahertz-wave bands based on the optical fiber network for some specific applications: foreign object debris detection systems for airport runway surveillance and high-speed railway radiocommunication systems between train and trackside. In the talk, we briefly introduce the R&D activities on the millimeter- and terahertz-wave for both wireless communication and radar/non-destructive imaging systems based on photonics.

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