Fibre-Optics solution for THz based 6G technology

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ABSTRACT:

The rapid evolution of wireless communication systems has led to emergence of Terahertz(THz) based 6G technology, unprecedented data rates and capabilities. The major role of fibre optics is to enable and enhance the potential of THz based 6G network. The resources of larger bandwidth and low signal attenuation of fiber-optic cables, Terahertz signals experience significant propagation loss and attenuation in the atmosphere. These high-frequency signals are easily absorbed by atmospheric gases and water vapor, limiting their range and coverage. Overcoming this challenge requires innovative techniques to mitigate signal degradation. The role of Optimization in THz communication and fiber optics could facilitate the development of new services and applications, ranging from IoT devices to high-definition video streaming to cloud-based services, all with enhanced speed and reliability. This chapter presents the design and integration of optical-fiber solutions for efficient THz signal generation, transmission, and reception for 6G technology and its related applications.

Keywords: Fiber-optic, 6G network, THz communication, Attenuation, optical-fiber solutions