

## THZ SEAMLESS NETWORKS FOR FUTURE MOBILE SERVICES

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THz radio links can offer over 10Gbps high-speed wireless transmission, where radio spectrum congestion is not yet so significant in THz bands (0.1-10 THz) [1]. However, even in THz bands, advanced modulation formats would be required as well as in conventional millimeter-wave or microwave bands, to increase spectral efficiency. Spectral efficiency and transmission capacity of THz communication systems will be reviewed in this presentation. We will share a survey result on power consumption of short-distance wireless systems. Power consumption reduction in radio transmitters is also very important to reduce operation cost of networks. The result implies that THz high-speed radio may provide effective transmission. However, the transmission distance of THz transmission should be shorter than a few hundred meters due to attenuation in the air. Thus, we should construct the THz networks consisting of many THz radio-links and optical fibers, which are connected by many media converters. We will discuss issues in such seamless networks. To offer a real-time THz transmission, the Horizon 2020 EU-Japan project ThoR (“TeraHertz end-to-end wireless systems supporting ultra high data Rate applications”) will develop an over 100 Gb/s radio transmission system using frequency band beyond 275 GHz [2]. An ultra-broadband, high linearity THz transmitter at 300 GHz will be demonstrated by using photonic local oscillators, multi-functional THz integrated circuits and traveling-wave tube amplifiers.

1. T. Kawanishi, A. Kanno, and H. S. C. Freire, “Wired and wireless links to bridge networks: Seamlessly connecting radio and optical technologies for 5G networks,” *IEEE Microw. Mag.*, vol. 19, no. 3, pp. 102–111, May 2018.
2. [www.ThoRProject.eu](http://www.ThoRProject.eu)

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