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Title:Interference investigations of active communications and passive earth exploration services in the THz frequency range

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Abstract:At Terahertz (THz) frequencies, passive space-borne Earth exploration services may be interfered by upcoming active communication applications. Aiming for coexistent use of the THz band by both active and passive applications, this paper identifies critical scenarios where interference can possibly occur. Atmospheric attenuation simulations are used along with appropriate propagation models to account for correct scenario-specific wave propagation conditions. Furthermore, distance-dependent measurements of the path loss are taken at 300 GHz. The atmospheric attenuation and propagation models are then employed in order to simulate possible interference powers for the individual reference scenarios under worst case-conditions. Based on existing data for the maximum allowed interference, guidelines for appropriate system specifications of active THz hardware (e.g., transmit power constraints) are developed and achievable system performances are evaluated. Countermeasures against potential interference are discussed. Thus, any interference can be anticipated and compensated for already in the early design phase of THz communication systems. © 2011-2012 IEEE.

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