The “challenging” world of Terahertz radiation and imaging

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Abstract. THz propagation through materials may reveal unique macroscopic and physical properties of their internal structure without the damage associated with ionizing radiation. The generation, radiation, and detection of THz signals relays into an intermediate region between microwave and optical frequencies seen as a transition in device physics from classical transport to quantum transition. The physical properties and parameters of the antennas and electronic devices at these frequencies (0.1-10THz) will we compared with their microwave and optical counterparts, the important differences highlighted and its significance in terms of spectral bandwidth and signal-to-noise ratio for near and short range imaging systems reviewed. Finally, some of the recent significant developments in the field will be summarized and the potential applications and future challenges and opportunities identified.