290. Title: Invited Review Article: Current State of Research on Biological Effects of Terahertz Radiation

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Abstract:Terahertz (THz) imaging and sensing technologies are increasingly being used in a host of medical, military, and security applications. For example, THz systems are now being tested at international airports for security screening purposes, at major medical centers for cancer and burn diagnosis, and at border patrol checkpoints for identification of concealed explosives, drugs, and weapons. Recent advances in THz applications have stimulated renewed interest regarding the biological effects associated with this frequency range. Biological effects studies are a valuable type of basic science research because they serve to enhance our fundamental understanding of the mechanisms that govern THz interactions with biological systems. Such studies are also important because they often times lay the foundation for the development of future applications. In addition, from a practical standpoint, THz biological effects research is also necessary for accurate health hazard evaluation, the development of empirically-based safety standards, and for the safe use of THz systems. Given the importance and timeliness of THz bioeffects data, the purpose of this review is twofold. First, to provide readers with a common reference, which contains the necessary background concepts in biophysics and THz technology, that are required to both conduct and evaluate THz biological research. Second, to provide a critical review of the scientific literature. © 2011 The Author(s).