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Title:Electromagnetic THz radiation modeling by DPSM

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Abstract:THz or T-ray imaging and spectroscopy are becoming increasingly popular nondestructive evaluation techniques for damage detection and characterization of materials. In order to understand the interaction between the T-ray electromagnetic waves and dielectric media a reliable model of electromagnetic wave propagation through dielectric materials must be developed. A recently developed semi-analytical method called the distributed point source method (DPSM) is extended to model electromagnetic wave propagation in THz range. Since T-ray signals generated by emitters or sources are close to Gaussian beams, the DPSM modeling is carried out for Gaussian beams generated by finite sized emitters. The DPSM generated results are compared with the analytical and experimental results. T-ray propagation in layered structures in absence of any anomaly and the interaction between the Gaussian beam and the spherical scatterer are also investigated. © Springer Science+Business Media, LLC 2012.

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Main heading:Terahertz spectroscopy

Controlled terms:Damage detection - Dielectric materials - Electromagnetic wave propagation - Gaussian beams

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