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Accession number:20122915250840
Title:Enhanced continuous-wave terahertz imaging with a horn antenna for food inspection
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Source title:Journal of Infrared, Millimeter, and Terahertz Waves
Abbreviated source title:J. Infrared. Millim. Terahertz Waves
Volume:33
Issue:6
Issue date:June 2012
Publication year:2012
Pages:657-664
Language:English
ISSN:18666892
E-ISSN:18666906
Document type:Journal article (JA)
Publisher:Springer New York, 233 Springer Street, New York, NY 10013-1578, United States
Abstract:Continuous-wave (CW) terahertz (THz) imaging with a horn antenna is proposed to enhance the spatial resolution of a THz imaging system. The attached waveguide that is smaller than the wavelength can easily increase the spatial resolution, and the optimized horn flare can significantly increase the transmission power. Consequentially, transmission THz images of a phantom obtained by the amplitude signal using a 0.2 THz wave reveal that the spatial resolution is achieved up to 500 μm. Also, the transmitted power is increased up to 6 times higher compared to the pinhole aperture. The feasibility of CW THz imaging with a horn antenna is demonstrated by the inspection of the organic samples inside food resulting in a relatively high sensitivity for soft organic samples compared with the sensitivity of X-ray imaging to this kind of samples. © Springer Science+Business Media, LLC 2012.
Number of references:13
Main heading:Terahertz waves
Controlled terms:Horn antennas - Image resolution
Uncontrolled terms:Continuous waves - Continuous-wave terahertz imaging - Food inspection - Foreign object - High sensitivity - Organic samples - Pinhole aperture - Spatial resolution - Tera Hertz - Terahertz imaging - THz imaging - THz waves - Transmission power - Transmitted power - Xray imaging
Classification code:711 Electromagnetic Waves - 716 Telecommunication; Radar, Radio and Television - 741 Light, Optics and Optical Devices - 742 Cameras and Photography
DOI:10.1007/s10762-012-9902-1
Database:Compendex