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Accession number:20120614756644
Title:Terahertz technology enables systems for molecular characterization
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Source title:Laser Focus World
Abbreviated source title:Laser Focus World
Volume:48
Issue:1
Issue date:January 2012
Publication year:2012
Pages:113-117
Language:English
ISSN:10438092
CODEN:LFWOE8
Document type:Journal article (JA)
Publisher:PennWell Publishing Co., 1421 South Sheridan Road, Tulsa, OK 74112, United States
Abstract:Smart terahertz scanning reflectometer and spectrometer systems exploit the ability of terahertz radiation to penetrate nonmetallic objects and sense the vibrational, rotational, and translational motions of molecules. The electro-optic (EO) method of terahertz generation is advantageous because the pump-terahertz conversion is not limited either by emission saturation or heat dissipation. The EO route main mechanisms include EO rectification (EOR) and difference frequency generation (DFG). Measurement of the concentration gradient of a biological or other fluid in a noninvasive fashion is important in several areas, including penetration of an active ingredient through human skin or other tissues. In common techniques such as Raman or IR spectroscopy, a sample is illuminated with a laser beam and the light is collected by a lens and passed through a monochromator. Wavelengths close to the laser line, due to elastic Rayleigh scattering, are filtered out while the rest of the collected light is dispersed onto a detector.
Abstract type:(Edited Abstract)
Number of references:4
Main heading:Optical frequency conversion
Controlled terms:Spectrometers - Terahertz waves - Tissue
Uncontrolled terms:Active Ingredients - Concentration gradients - Difference-frequency generation - Human skin - Laser lines - Molecular characterization - Tera Hertz - Terahertz generation - Terahertz radiation - Terahertz technology - Translational motions
Classification code:461.2 Biological Materials and Tissue Engineering - 711 Electromagnetic Waves - 741.1.1 Nonlinear Optics - 801 Chemistry
Database:Compendex