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Accession number:20114114412960
Title:Sub-terahertz spectroscopic system using a continuous-wave broad-area laser diode and a spatial filter
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Source title:Journal of Applied Physics
Abbreviated source title:J Appl Phys
Volume:110
Issue:6
Issue date:September 15, 2011
Publication year:2011
Article number:063107
Language:English
ISSN:00218979
CODEN:JAPIAU
Document type:Journal article (JA)
Publisher:American Institute of Physics, 2 Huntington Quadrangle, Suite N101, Melville, NY 11747-4502, United States
Abstract:We have proposed a low-cost type spectroscopic system in the sub-THz region similar to the THz-TDS, in which we use a continuous-wave broad-area laser diode (BLD). The Fourier spectrum of the signal waveform is discrete and is very weak at frequencies between the discrete peaks when the BLD beam is used in free space. In order to make the spectrum suitable for spectroscopy, the BLD beam is used through a spatial filter (SF) and as a result, the amplitude of the continuous spectral components between the discrete lines increases considerably. This change is explained by considering the filtering effect of the beam patterns of the BLD by the SF. Further, we show that the signal and then the signal-to-noise ratio of the transmission spectra of a sample are enhanced by using the SF compared with our previous work.
Number of references:20