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标题: Combination of Kramers-Kronig transform and time-domain methods for the determination of optical constants in THz spectroscopy
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摘要: Absorption and reflection spectra have successfully been used for substance identification, which is also applicable to the THz spectral range. For optical spectroscopy, the Kramers-Kronig transformation (KKT) is a powerful tool to determine the complex refractive index (n) over tilde (with k, n absorption and refractive indices, respectively) from either an absorption or reflection measurement. By terahertz time-domain spectroscopy (THz-TDS) materials are probed with short pulses of radiation. The detection is sensitive to the sample on both the amplitude and the phase of the electrical field. Thus. THz-TDS spectroscopy can provide more information than conventional Fourier-transform spectroscopy, by which a power spectrum is measured. In the case of transmission measurements, for instance, formulae exist by which the frequency-dependent complex refractive index is directly calculated from the time-dependent electrical field (waveform) without the necessity of a KKT. In the case of reflection experiments, a comparable computation is possible for the frequency-dependent phase angle; here a KKT can help to recover essential parameters. We present a combination of KKT and TDS methods for the calculation of optical constants in the THz regime. 
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