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Abstract:We derive the spectral analogues of the Maxwell equations for describing the propagation of electromagnetic waves in linear and weakly nonlinear dielectric media, which can be useful for the THz spectroscopy of short pulses. We discuss the solutions of those equations for TM and TE polarized nonlinear waves. We obtain analytical solutions of these equations for the case of linear homogeneous isotropic and weakly nonlinear media, and also analyze the patterns of the Fresnel and Fraunhofer diffraction of single-cycle Gaussian THz pulses. © Springer Science+Business Media, LLC 2012.
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