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Title: Theory of a laser-plasma method for detecting terahertz radiation

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Abstract: A theory is developed for calculating the spectrum and the shape of a terahertz wave packet from the temporal profile of the energy of the second harmonic of the laser field generated during nonlinear interaction of laser and terahertz pulses in an optical-breakdown plasma. The spectral and temporal characteristics of the second-harmonic envelope and a terahertz pulse are shown to coincide only for short laser pulses. For long laser pulses, the second-harmonic spectral line shifts to the red and its temporal profile is determined by the time integral of the electric field of terahertz radiation.

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