

276. Title:Terahertz emission dependence on the irradiating laser pulse width in generating terahertz waves from two-color laser-induced gas plasma

Authors:Dai, Houmei (1); Liu, Jinsong (1)

Source title: Journal of Modern Optics

Volume:58

Issue:10

Issue date:June 10, 2011

Publication year:2011

Pages:859-864

Language:English

Document type: Journal article (JA)

Abstract:A transient photocurrent model is used to explain terahertz (THz) emission from gas plasma irradiated by two-color laser pulses, with one the second harmonic of the other. Taking multiple degrees of ionization into account, the gas ionization process at different irradiating laser pulse width is discussed. Then the corresponding terahertz spectrums and waveforms in this optical process are calculated, results showing that keeping the irradiating pulse energy invariant, the ultimate THz emission can be significantly increased by shortening the irradiating pulse width. Besides, by comparison with the corresponding results when only considering single ionization, one can see that the double ionization begins playing an important role under the intensity range of our interest, and thus should not be neglected.