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Tunnel Ionization by Two Linearly Polarized Lasers: Generation of THz Radiation ANIL MALIK, HITENDRA MALIK, Indian Institute of Technology Delhi, ULRICH STROTH, IPF, Stuttgart University, Germany — The THz radiation generation has received great deal of attention due to its diverse applications in the field of material characterization, topography and remote sensing, chemical and security identificationetc. In order to develop high-power and efficient THz sources, several schemes have been proposed. For example, THz radiation can be generated by superluminous laser pulse interaction with large band gap semiconductors and electro-optic crystals, on synchrotron radiation from bunched electron beams etc. In the present investigation, an analytical study is made for the THz radiation generation based on tunnel ionization achieved by superposition of two linearly polarized femtosecond laser pulses focused on the gas after passing through an axicon. These lasers are considered to have the same frequencies but different field amplitudes and phases. In this mechanism, the initial phase of the envelope plays an important role in optimizing the rate of ionization and subsequently the residual current due to dipole oscillations. Since a nonuniform plasma is produced during the tunnel ionization, the effect of radial variation in the electron density in the plasma channel is studied on the frequency of the THz radiation and on its power.

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