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Title:On the peculiarities of THz radiation generation in a laser induced plasmas
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Abstract:Experimental data on terahertz generation from laser spark created by linearly polarized femtosecond pulses focused by spherical lenses are presented. Specific features of generated terahertz radiation registered in the latest experiments for the case of monochromatic laser pulse definitely demonstrate severe deviation from the axial symmetry, which results from conventionally used model for low-frequency current excitation in a laser spark due to the ponderomotive action from fs laser pulse. The new approach to the theoretical interpretation basing on kinetic description for electron distribution function has been developed with taking into account peculiarities of the tunnel ionization under the action of linearly polarized laser field. A simple generalization of developed model for the case of applying external dc electric field to the region of gas breakdown allowed to describe the modification of terahertz radiation pattern depending on the value of external dc field.
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