Abstract Submitted
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Tomographic diagnostics of nonthermal plasmas NATALIA DENISOVA, Institute of Theoretical & Applied Mechanics — In the previous work [1], we discussed a "technology" of tomographic method and relations between the tomographic diagnostics in thermal (equilibrium) and nonthermal (nonequilibrium) plasma sources. The conclusion has been made that tomographic reconstruction in thermal plasma sources is the standard procedure at present, which can provide much useful information on the plasma structure and its evolution in time, while the tomographic reconstruction of nonthermal plasma has a great potential at making a contribution to understanding the fundamental problem of substance behavior in strongly nonequilibrium conditions. Using medical terminology, one could say, that tomographic diagnostics of the equilibrium plasma sources studies their "anatomic" structure, while reconstruction of the nonequilibrium plasma is similar to the "physiological" examination: it is directed to study the physical mechanisms and processes. The present work is focused on nonthermal plasma research. The tomographic diagnostics is directed to study spatial structures formed in the gas discharge plasmas under the influence of electrical and gravitational fields. The ways of plasma "self-organization" in changing and extreme conditions are analyzed. The analysis has been made using some examples from our practical tomographic diagnostics of nonthermal plasma sources, such as low-pressure capacitive and inductive discharges.
[1] Denisova N. Plasma diagnostics using computed tomography method // IEEE Trans. Plasma Sci. 2009 37 4 502.

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