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MODELING OF PLASMA DYNAMICS PARAMETERS OF MAGNETOPLASMA COMPRESSOR*

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The prospect of using magnetoplasma compressor (MPC) in compact radiation sources and pulsed plasma jets to reduce their mass and size characteristics, the formulation of ways to improve their physical and technical characteristics and control the integral output of broadband radiation is justified by a large number of publications [1-5]. High velocity jets formed by magneto plasma compressor can be used for fusion devices, aeronautics, mechanical and power engineering systems [7-12]. Thermal modeling of radiation-magneto plasma dynamic processes of powerful electric discharge sources is presented.

The paper contains a mathematical model of MPC discharges in gases for a wide range of changes in the main parameters and the surrounding gas environment. This model is based on a nonstationary axisymmetric two dimensional system of equations for viscous one-temperature radiation plasma dynamics. The numerical solution of the nonstationary two dimensional radiation gas dynamic model developed in the work is based on the method of splitting into physical processes and spatial directions. The developed computational code uses a multi-block multigrid technology for calculations on nonorthogonal structured grids. On the basis of the performed computational studies, quantitative data were obtained on the modes, structures, and plasma dynamics of the end type MPC for the transient power - power mode of the MPC discharge in gas [13-19].

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