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Hydrodynamic approach to modeling of plasma processes under the action of pulsed electron beam[1] NURKEN AKTAEV, GENNADY REMNEV, Tomsk Polytechnic University, ALEXANDR YALOVETS, South Ural State University — The investigation is devoted to the mathematical modeling of action of pulsed high intensity pulse electron beam (HIPEB) on one-component molecular gas. The characteristic parameters of HIPEB are: energy of electrons is 300-500 keV, current density is 500-1000 A/m^2, pulse duration is 100 nsec, and gas pressure is varied from 10 to 100 kPa. Under the action of PHPEB on gas the nonequlibrium plasma is formed. Because the beam energy is transferred to the gas through the electronic component the electron and ion temperatures vary significantly. The time for alignment of the temperatures is very large because of the relatively small pressures. The theoretical investigation of the plasma processes under the action of HIPEB has performed within the framework of one-liquid two-temperature hydrodynamic model. Because of the electron and ion temperatures vary significantly we use the separate equations for thermal balance. As a result of the numerical modeling the main channel of energy dissipation of electron beam is revealed. The energy pumping from electron to ion subsystem is also discussed.

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Nurken Aktaev
Tomsk Polytechnic University

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