



ЛАБОРАТОРИЯ ИНФОРМАЦИОННЫХ ТЕХНОЛОГИЙ

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Room 310

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Solving the optimization problem for designing a pulsed cryogenic cell

The problem of optimizing the characteristics of a cryogenic cell heat source, namely, a multilayer cylindrical configuration designed for a pulsed portion injection of working gases into the ionization chamber of a multiply charged ion source, is considered. In order to solve the optimization problem, the hybrid MPI+OpenMP algorithm for parallel calculations based on the enumerative method for finding the maximum of the proportionality integral to the gas volume evaporated from the cell surface has been developed and implemented. The algorithm leads to the multiple solution of the initial boundary value problem for the heat equation, which is solved numerically by the variable direction method. For non-linear difference equations, a scheme of simple iterations with an adaptive time step has been realized. The solution of the optimization problem for a specific cell configuration on the “GOVORUN” supercomputer has demonstrated a multiple acceleration of calculations.