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Solving the Optimization Problem for Designing a Pulsed Cryogenic Cell

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The paper considers the problem of optimiziation of the heat source characteristics of the cryogenic cell – a multi-layer cylindrical configuration of the sandwich type, intended for pulse dosed injection of the working gaseous spicies in to the ionization chamber of the multiply charged ion source. For solving the optimization problem, a hybrid MPI+OpenMP parallel computation algorithm based on the brute force method for finding the maximum of the proportional integral of the volume of the gas evaporated from the surface of the cell has been developed and implemented. The solving of the optimisation problem for the particular configuration of cells using the cluster "Govorun" has demonstrated the acceleration of calculations in the tens and hundreds of times.

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