**BIFURCATION OF SPATIALLY NONUNIFORM REGIMES IN ONE BOUNDARY-VALUE PROBLEM WITH DEFLECTION**

Leonid Ivanovsky1,2, Sergey Kaschenko1,3

1 P.G. Demidov Yaroslavl State University,

2 Scientific Center in Chernogolovka RAS,

3 National Research Nuclear University MEPhI.

*leon19unknown@gmail.com*, *kasch@uniyar.ac.ru*

Let us consider nonlinear parabolic boundary-value problem:

(1)

with boundary conditions

Parameters , , smooth function has an infinitesimal order more than the first.

Equally with parabolic boundary-value problem (1), let us consider the following system of differential equations:

, , (2)

which model this problem. In this case boundary conditions substitute for

,

.

The problem of oscillatory loss of stability for spatially nonuniform regimes of system (2) is interesting.

Our task of research was to find critical values of parameter , when in system (2) there appears Andronov-Hopf bifurcation.

The research was carried out by means of special software. All calculations were performed on a large number of independent streams of GPU. So the program uses the technology of parallel calculations NVIDIA CUDA.

As a result of numerical research there were found spatially nonunifom regimes, which branch by reason of Andronov-Hopf bifurcation.

This work was supported by the Russian Science Foundation (project nos. №14-21-00158).

*Keywords:* Andronov-Hopf bifurcation, nonlinear parabolic boundary-value problem, spatially nonuniform regime.