FLOWS OF COMPRESSIBLE VISCOUS HEAT-CONDUCTING GAS, DETERMINED USING TRIGONOMETRIC SERIES

S. P. Bautin[1], A. G. Obukhov[2]

[1]Snezhinsky Institute of Physics and Technology of the National Research Nuclear University MEPhI, Snezhinsk, Russia

[2]Tyumen Industrial University, Tyumen, Russia

In [1–4], an approach to solving nonlinear partial differential equations in the form of infinite trigonometric series of two spatial variables was proposed. The coefficients of the series are the desired functions of time, for which an infinite system of ordinary differential equations is written out. The theorems on multiple frequencies and on the convergence of infinite trigonometric series in a certain neighborhood of the point $t = 0$ and for all values of the independent variables x, y are proved. When describing specific two-dimensional periodic flows at the initial moment, data are given in the form of finite linear trigonometric sums. Approximate solutions to the Cauchy problems are also constructed in the form of finite segments of trigonometric series. The coefficients of these finite sums are numerically determined when solving the corresponding Cauchy problems for finite systems of ordinary differential equations. With different sets of initial data, the corresponding nonstationary two-dimensional periodic flows are constructed in spatial variables x and y and their properties are analyzed.

References

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