UDC 629.78.067:620.196:523

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NUMERICAL SIMULATION OF AXISYMMETRIC FLOW PAST EXTENDED COMPOUND BODY USING TEST PARTICLES METHOD WITH HIERARCHIC GRIDS

The present paper continues the study on evolution of the test particles method (TPM). The advantages of a hierarchic two-level non-uniform grid over a computational uniform grid (CUG) are presented with provision for extensive zones with a low density. Thus, a hypersonic flow past the axisymmetric extended compound body at 0-deg angle of attack is considered for conditions of the experiment published previously. The resulted isolines of a dimensionless density correspond to the available experimental data and results of the TPM computations using a uniform grid.

In going from the uniform grid to the hierarchic two-level non-uniform grid, a general number of computational meshes are sufficiently reduced saving their dimensions in zones with small lengths of a free molecular path, and in so doing the computer resources are efficient without lowering the accuracy of the results obtained. The hierarchic two-level non-uniform grid gives the CUG analogue quality of the results (distributions of the gas dynamic parameters and values of the coefficients of drag) as the number of meshes increase 50 times and the computational time reduces 5 times.

Keywords: *Monte-Carlo method, test particles method, hierarchic two-level unstructured grids, numerical simulation.*

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