

## NUMERICAL SIMULATION OF AXIALLY SYMMETRIC FLOW AROUND BODIES OF SIMPLE CONFIGURATIONS USING HIERARCHY GRIDS

A variation of the statistic Monte-Carlo method for the stationary statement, namely test particles method (TPM), is considered. The study objective is to develop the TPM using computations on hierarchy grids. The replacement of the uniform structured grid used for discretization of the computational domain with the non-uniform hierarchy grid made possible the TPM updating and optimizing the computer resources. It was found that a two-level hierarchy unstructured grid (TLIUG) is best suited to the TPM. The assessment of the advantages of the TLIUG is made possible by comparing the time taken, the grid characteristics and qualities of the distributed gas dynamic parameters in the vicinity of streamlined barriers with the similar data previously obtained on the uniform grids.

The developed algorithm of the TPM on the TLIUG is tested using a numerical simulation of an axially symmetric flow around bodies of simple configurations under different flow conditions. A comparison of the integral characteristics of bodies under consideration and the distributed gas dynamic parameters in their vicinity with the available experimental data, those of an integral method and a theory of local interactions and similar results of the TPM on the uniform computational grid demonstrated their complete agreement.

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

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