AERODYNAMIC DRAG MEASURING FOR TWO CONSISTENTLY LOCATED AXISYMMETRICAL MODELS DURING THEIR SEPARATION

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This work refers to aerodynamic interference between the separating bodies. It is devoted to complex numerical and experimental studies of the drag change coaxially located bodies of simple geometric forms during their separation in a supersonic flow.

The experiments were executed in a supersonic wind tunnel T-313 in ITAM SB RAS and the main idea was a continuous measurement of aerodynamic forces acting on separating models by using inside located strain gages balances.

Numerical studies of flow around separating bodies were performed using the SolidWorks+ANSYS software. This package uses the finite volume method and the stationary Navier – Stokes equations. It was assumed that the boundary layer on the surface of the model is in a turbulent state. In the calculations $k - \varepsilon$ turbulence model was used.

Calculated and experimental data of changes in drag of each model in the process of separation were obtained. The maximum distance between the model was two diameters in the experiment and fifteen diameters during calculations. These results complement the existing understanding of the physics of the separation process coaxially located bodies, including quantitative characteristics of changes in their aerodynamic drag, and could be useful for the aviation and space profile specialists.

Keywords: separation, interference, aerodynamic drag.