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NUMERICAL SIMULATION OF SUPERSONIC FLOW OVER ZENIT-2SLБ LAUNCH VEHICLE

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The results of a numerical simulation of a supersonic flow over the Zenit-2SLБ launch vehicle at angle of attack 5, 15 and 25 degrees are presented. Attention in this work is devoted to obtaining the proved three-dimensional vortex structure of the flow around the Zenit-2SLБ launch vehicle. The numerical simulation is based on the unsteady three-dimensional Reynolds-averaged Navier–Stokes equations for a compressible gas. Reference equations are solved by the control volume method. From computations three characteristic regimes of the flow around a rocket body at angle of attack are obtained, including a nonstalling flow around a cylindrical body part, attached and unattached separation of flow at cross section. The simulation results correlate satisfactorily with the existing computations and experimental data.

Keywords: *supersonic flow around, Zenit-2SLБ launch vehicle, Navier-Stokes equation, numerical simulation.*

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