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SPECIAL FEATURES OF DECELERATION OF A SUPERSONIC FLOW THROUGH CONVERGENT CHANNEL

A numerical simulation of the gas dynamic parameters of a supersonic flow in decelerating through a variable-section channel is carried out in the context of a viscous layer model. The capability of applying a marching algorithm for operative engineering calculations of the flow through channels of supersonic air intakes in the presence of limited subsonic regions is illustrated considering a boundary layer without separation zones and those of a reactive flow. Pressure surface distributions and those of a field of pressure isolines and the M number through a channel are presented. The effects of the Reynolds number, turbulent viscosity and an angle of attack on the compression ratio and the structure of a supersonic flow and formation of zones of a subsonic flow are shown. The influence of viscosity both under laminar and turbulent conditions of the flow is small in relation to the parameters of deceleration into the channel inlet and results in a significantly higher pressure and the extended regions of a subsonic flow into its a narrow section.

Keywords: *numerical simulation, marching methods, turbulence, decelerations of supersonic flow.*

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