

INFLUENCE OF LOCAL CHANGE OF FLOW TEMPERATURE ON THE PARAMETERS OF SONIC BOOM FROM THE THIN AXISYMMETRIC BODY

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The present work studied the possibility to reduce the sonic boom by the local heat supply to the supersonic gas flow close to the thin body. The Mach number of the free stream was set equal to 2. The calculations were done applying a combined method. This method supposes consequential calculations of the near and far flow fields. The numerical calculations of the near field were done applying the model of viscous heat-conducting gas. Two dimensional unsteady equations of Navier –Stokes were used. The parameters calculated of the near field were initial for calculating the sonic boom. The far field was calculated by the method of "phantom bodies". The calculations were done for the sphere and torus shaped heat supply zones. The calculations results showed that there is possibility to reduce the sonic boom by the local heat supply to the supersonic gas flow close to the body. For this one should use gas-dynamic features of the flow.

Keywords: Shock waves, sonic boom, thin body, heating the flow, "phantom bodies" method