

## THE INFLUENCE OF ENERGY RELEASE IN ELECTRICAL DISCHARGE REGIONS NEAR FLYING BODIES ON THEIR AERODYNAMIC CHARACTERISTICS

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The new possibilities of remote energy release to the air in localized electrical discharge regions enhanced the interest to the influence of this kind of air perturbation in the vicinity of flying body on its aerodynamic characteristics.

In Russia as well as in a number of other countries the broad theoretical and experimental investigations related to this problem are now in progress.

The paper estimates the possible efficiency of electrical discharges as a new mean to control the aerodynamic characteristics of flying bodies and presents the recent state of the art in this field.

Analytical and mainly computational results are presented concerning the supersonic flow around bodies in the presence of energy release regions ahead of the body or near its surface including the viscous boundary layer. Most of these results are based on the Euler or Navier-Stokes equations and use the model of thermally and calorically perfect gas.

The shape and location region of the energy release as well as the intensity and distribution of the energy release-steady or short periodic-were considered as prescribed.

Some examples are given of flow calculations around models tested in aerodynamic tunnels taking into account nonequilibrium excitation of vibrational energy of molecules in the regions of electrical discharge.

The analyses is given of experimental data on supersonic flows around bodies in aerodynamic tunnels in the presence of electrical discharge regions ahead of the body or near its surface.

Some experiments are described dealing with different type electrical discharges in moving air as well as the results of theoretical modelling of air vibrationally excited by pumping energy to electrons and its application to some gasdynamical problems.

The considerations are on the directions of further investigations interesting for applications to aerodynamics.