













amplitude and spectrum of external disturbances vary in different wind tunnels and in the flight, the transition appears at different values of  $N$ . Therefore, in this paper the estimate of the transition Reynolds number  $Re_{tr}$  has been performed for different values of the  $N$ -factor. The results for the injection of  $CCl_4$  are presented at Fig.7. One can see that variation of the injection factor from zero to the value  $-f_w = 0.2$  causes more than a double enlargement of the transition Reynolds number  $Re_{tr}$  independently of a value of the  $N$ -factor. This corresponds to a fourfold enlargement of the streamwise extent of a laminar region on a model.

## 4 Conclusions

System of equations of the compressible binary gas mixture boundary-layer in the approximation of a local self-similarity at foreign gas injection from a permeable model surface and its stability is developed.

Parametric calculations of the flat-plate boundary-layer profiles have been performed. It has been found that heavy gas injection influences the boundary-layer density profile similar to the influence of surface cooling. Both of them facilitate boundary-layer stabilization and noticeable laminar-turbulent transition delay.

It is obtained that increase of a foreign gas injection leads to a reduction of the skin friction and the wall heat flux. It is established that injection of a heavier gas leads to the reduction of perturbation growth rates. A possibility to enlarge in four times the length of a laminar region in Mach=2 boundary layer by means of a heavy gas injection is found.

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