

# A GENERALIZED METHOD FOR SOLVING BOUNDARY-VALUE PROBLEM IN FLUID MECHANICS WITH EXPERIMENTALLY DETERMINED BOUNDARY CONDITIONS

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This paper studies the influence of perforated walls of transonic wind tunnels on two-dimensional investigations which employ the generalized method for solving Dirichlet's problem formulated for the rectangle of the wind tunnel's work section.

In order to preserve the realistic features of the flow at the work section's boundaries, the boundary conditions, which are required to be known to solve this type of boundary problem, are experimentally determined by measuring the static pressure distribution in the vicinity of the work section walls. To demonstrate the appropriateness of the presented generalized method for calculation of transonic wind tunnel wall interference at two-dimensional investigations, the algorithm has been applied to the aerodynamic experimental results from investigations of NACA 0012 airfoil obtained in transonic wind tunnel in the Aeronautical Institute - VTI (Yugoslavia).

The corrections have been interpreted in terms of the way that the pressure distribution measured over the airfoil's surface in wind tunnel investigation at the undisturbed flow Mach number  $M_{\infty}$ , corresponds to the distribution which would be obtained if the airfoil were investigated in a free air flow (unconstrained by wind tunnel walls) at a Mach number  $M_{\infty} + \Delta M$ .

## References

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