Inverse boundary value problem for an ekranoplan airfoil with blowing

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Abstract

An inverse boundary value problem of aerodynamics is formulated and solved for an ekranoplan airfoil with blowing through a slot. An airfoil moving with constant velocity along a flat ground surface is considered. The slot is modeled by an annular or straight duct with constant wall velocities. The densities and total pressures in the blown jet and external flow are different. Consequently, the flow velocity is discontinuous across the slip lines. An iterative solution process is developed, and examples of airfoils are constructed for various characteristics of both upper and under-the-wing surface blowing and for various heights. Conclusions are drawn about the effect of blowing parameters on the airfoil geometry and aerodynamics. Copyright © 2004 by MAIK "Nauka/Interperiodica".