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New Numerical Method for Complex Interacting Flows

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New numerical method of second order accuracy for solving the boundary layer equation with interaction is suggested. It is well known that a given displacement thickness defines solution of 2D boundary layer equation by the only way. This function is considered as the only unknown grid function in the problem. As a result amount of unknowns equals to number of nodes along X-axis. The main problem is to create a set of equations which define this grid function. Such set of equations may be formulated as zero difference between pressure gradient computed from BL calculation and pressure gradient found from interaction law. Introduced implicit set of equations is solved by Newton method which gives high convergence. Flow past a weak corner of a body contour was computed first. Second solved problem with using of proposed method is a mixing of boundary layers flowing from the edge of a wing.

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