Numerical Solution of Compressible Transitional Flows Using Algebraic Model of Transition

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Abstract

This work deals with the numerical simulation of laminar-turbulent transition using algebraic model based on the computation of the intermitency coefficient. Algebraic model of transition is implemented to the in-house software for the simulation of 2D compressible turbulent flows using Reynolds averaged Navier-Stokes equations (RANS) closed by the two-equation $k-\omega$ TNT model or the explicit algebraic Reynolds stress model (EARSM). Numerical solution is obtained by the finite volume method based on the HLLC scheme with piecewise linear MUSCL reconstruction and explicit TVD Runge-Kutta method with point implicit treatment of the source terms. The proposed method is validated on the ERCOFTAC T3 test cases.

References

1. P. Straka and J. Příhoda and D. Šimurda. Modelling of the effects of the foregoing wake on the bypass transition on the airfoil. Experimental Fluid Mechanics 2011, Jičín 2011.