

Prediction of Turbulent Separated Flow in a Wind Tunnel

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Abstract : In the present study, the subsonic flow in an asymmetrical diffuser was simulated numerically using code CFX 11.0 and its generator of grid ICEM CFD. Two models of turbulence were tested: K- ϵ and K- ω SST. The results obtained showed that the K- ϵ model singularly over-estimates the speed value close to the wall and that the K- ω SST model is qualitatively in good agreement with the experimental results of Buice and Eaton 1997. They also showed that the separation and reattachment of the fluid on the tilted wall strongly depends on its angle of inclination and that the length of the zone of separation increases with the angle of inclination of the lower wall of the diffuser.

Keywords : asymmetric diffuser, separation, reattachment, tilt angle, separation zone

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