

Numerical study of turbulent heat transfer in separated flow: review

Abstract

The numerical studies of turbulent heat transfer in separation flow presented in this paper. Enhancement of heat transfer rate in turbulent separation flow at sudden expansion in passage, over forward or backward facing-steps, blunt body, ribs channel, and swirl generators in channels were investigated numerically. Different models (CFD) used to study heat transfer characteristics and fluid flow in separation and reattachment region and compared results with previous experimental data. The effect of expansion ratio, Reynolds number, step height, (shape, number, and angle) of ribs and (length, twist angle, and gap width) twist the tape on improvement of heat transfer were referred. The numerical results indicated increases of heat transfer coefficients with increases in the above parameters. The numerical simulations derived from finite volume, element, and difference methods for evaluation of turbulent heat transfer in separated flow and employed several computational programs.

Keyword: Separation flow; Sudden expansion; Facing-step; Twist tape; Swirl flow; Ribbed channel