Article Abstract

Title:	A numerical study on the flow through a plane symmetric sudden expansion with a fence viewed as a diffuser
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Abstract:	The numerical analysis and performance simulation of a sudden expansion with fence viewed as a diffuser are presented in this paper. SIMPLE algorithm is used to solve two-dimensional steady differential equations for conservation of mass and momentum. The Reynolds number is in the range of 20 to 100 and fence subtended angle *(FSA)* between 10˚ to 30˚. The location of fence from throat varies from 0.2 to 2.6. An aspect ratio for all computations is taken to be 2. The effect of each variable on average static pressure, diffuser effectiveness, distance of maximum static pressure rise and average stagnation pressure have been studied in detail, and comparisons are made with respect to simple sudden expansion without fence. It is revealed from the computation for lower Reynolds number regime that the effectiveness with fence offers benefit depending on the positioning of the fence and fence subtended angle. Fence at any location always offers benefit at relatively higher Reynolds number at any value of fence subtended angle. Fence subtended angle and location of fence have no appreciable impact on distance of maximum static pressure rise from throat and average stagnation pressure drop at a particular value of Reynolds number.
Keywords:	Sudden expansion, fence, Reynolds number, static pressure, diffuser effectiveness, stagnation pressure.