

Abstract Submitted
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POD analysis of laminar flow in a two-dimensional 180-degree sharp bend with bypass. KOUSHIK CHANDRAMOULI, ARUL PRAKASH K, Indian Inst of Tech-Madras — A Proper Orthogonal Decomposition analysis on laminar flow physics in a 180-degree sharp bend with bypass is demonstrated. The unsteadiness in the flow field observed downstream of the bend and the bypass is captured. The data for POD analysis has been obtained by solving mass, momentum and energy equations in Cartesian framework using Streamline Upwind/Petrov-Galerkin Finite element method. A parameter called IOR (Inlet to Outlet Ratio) is defined based on the inlet and outlet domain heights, with a bypass in the divider at 3 different locations. The fluid flow involves steady, periodic unsteady and chaotic unsteadiness and POD is conducted for the transient cases. The presence of the bypass increases the interaction of the vortices with the fluid from the bypass. The simulated results demonstrate the understanding of the vortices interaction with the walls and each other and thus the enhancement in the heat transfer.

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