

Abstract Submitted  
for the DFD17 Meeting of  
The American Physical Society

**Three-dimensional numerical study of heat transfer enhancement in separated flows** SAURAV KUMAR, S. VENGADESAN, Indian Inst of Tech-Madras — The flow separation appears in a wide range of heat transfer applications and causes poor heat transfer performance. It motivates the study of heat transfer enhancement in laminar as well as turbulent flows over a backward facing step by means of an adiabatic fin mounted on the top wall. Recently, we have studied steady, 2-D numerical simulations in laminar flow and investigated the effect of fin length, location, and orientation. It revealed that the addition of fin causes enhancement of heat transfer and it is very effective to control the flow and thermal behavior. The fin is most effective and sensitive when it is placed exactly above the step. A slight displacement of the fin in upstream of the step causes the complete change of flow and thermal behavior. Based on the obtained 2-D results it is interesting to investigate the side wall effect in three-dimensional simulations. The comparison of two-dimensional and three-dimensional numerical simulations with the available experimental results will be presented. Special attention has to be given to capture unsteadiness in the flow and thermal field.

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Date submitted: 31 Jul 2017

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