

Abstract Submitted  
for the DFD15 Meeting of  
The American Physical Society

**The effect of splitter plate on fluid flow and heat transfer characteristics past various bluff-body configurations** SUNAKRANENI SOUMYA, Graduate student, Indian Institute of technology Madras, K. ARUL PRAKASH, Associate Professor, Indian Institute of technology Madras — Numerical simulation of five different bluff body configurations with splitter plate is carried out to analyse the fluid flow and heat transfer characteristics for Reynolds number (Re) ranging from 50-200. The governing equations are discretized using SUPG - finite element method. The bluff body configurations considered are elliptic cylinder of axis ratios (AR=0.5-1.0), square cylinder, rhombus of axis ratios (AR=0.5-1.0), equilateral triangle, and semi-circular cylinder. The splitter plate length varied from  $L=0.0D_h$ - $6.0D_h$ , ( $D_h$  = Bluff body hydraulic diameter). It is observed that interaction of separated shear layers from top and bottom surfaces of the body is inhibited and vortex shedding is suppressed for certain combinations of bluff body configuration, Re and splitter plate length and wake region is modified significantly. Reduction in drag approximately of the order 2% to 50% is attained and overall heat transfer (Q) is increased due to splitter plate.

Sunakraneni Soumya  
Indian Institute of technology Madras

Date submitted: 30 Jul 2015

Electronic form version 1.4