

Abstract Submitted
for the DFD09 Meeting of
The American Physical Society

Interaction of a wall jet with wake behind a bluff body in an open channel ARINDAM SINGHA, RAM BALACHANDAR, University of Windsor — Junction flow around a bluff body mounted in bed has been the subject of investigation for decades because of the unique phenomenon associated with the generation and dynamics of the horseshoe vortices. However, a more interesting flow could be the case where a small bleed flow in the form of a wall jet is allowed to pass beneath the bluff body and let interact with the horseshoe vortex. If this flow is strong, it can completely deteriorate the effect of the horseshoe vortex and may result into a complex three-dimensional flow. To explore the characteristics of this kind of flow a sharp-edged bluff body was mounted in an open channel flow of nominal flow depth of 100 mm. Three flow configurations were examined: a) the body was mounted firmly on the floor, b) the body was lifted 5 mm from the bed and c) the body was lifted 10 mm from the bed. Particle image velocimetry measurement was performed at three horizontal planes, at $y/H = 0.10, 0.50$ and 0.80 , respectively, where H is the nominal depth of flow. Time-averaged flow parameters were examined at selected streamwise locations at different vertical elevations to examine the effect of wall jet to change the characteristics of the wake.

Arindam Singha
University of Windsor

Date submitted: 07 Aug 2009

Electronic form version 1.4