DNS of the transition from absolute to convective instability for transverse jets[1] ERIN MUSSONI, PRAHLADH IYER, KRISHNAN MAHESH, University of Minnesota — Direct numerical simulations are performed to study the transition from absolute to convective instability for incompressible jets in crossflow using an unstructured finite volume solver. Flow conditions are based on experimental conditions of Megerian *et al.* (2007) for a flush injected jet. Results obtained from simulated jet velocity ratios of 2 and 4 are compared with experimental data (Getsinger *et al.* 2011 and Megerian *et al.* 2007) and show good agreement in instantaneous and time averaged flow characteristics as well as velocity spectra. Behavior of fluid flow in the near field, such as the recirculation region inside the nozzle for low jet velocity ratios, is discussed to examine the stability transition with increasing jet velocity ratio. Global stability analysis is used to further explore the absolute to convective instability transition.

Erin Mussoni
University of Minnesota

Date submitted: 03 Aug 2012   Electronic form version 1.4