

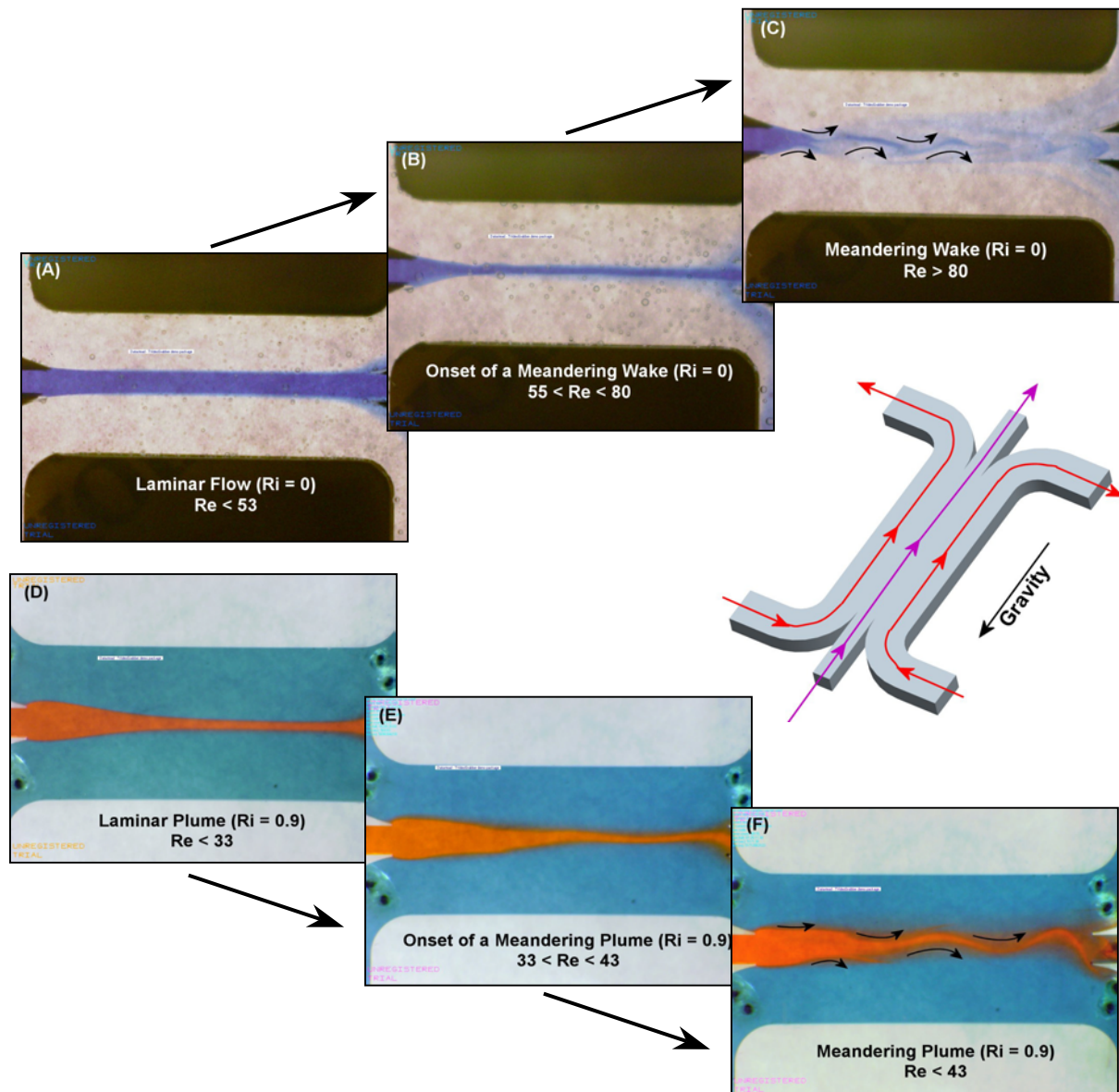
Visualising the Onset of Meandering Structures in a Small Length Scale Fluidic Junction Using Dye Injections

Walsh, P. A.* , Davies, M. R. D.* and Dalton, T.*

* Stokes Research Institute, University of Limerick, Rep. of Ireland.

E-mail: Pat.Walsh@ul.ie

Received 2 August 2005



Figures (A) – (C) and (D) – (F) depict the transition from laminar to meandering flow in the fluidic junction shown schematically. The first set of images, (A) – (C), are captured from isothermal streams merging at the junction (i.e., Richardson number of zero). It is seen that when the Reynolds number of the outer stream reaches approximately 65, a slightly buckled wake is observed. On increasing this value further these buckles are seen to develop into a classical Von Karman Vortex street. The second set of images, (D) – (F), depict a similar transition to a buckled wake for the case of non-isothermal streams (Richardson number of 0.9) merging at the fluidic junction under buoyancy opposing flow conditions. It is observed that the critical Reynolds number to define the transition from a laminar to a meandering wake reduces significantly as the Ri increases from the isothermal case.