
Seminar

Effects of wall-geometry on the stability of channel flow, and of variable properties on film flow

Mamta Raju Jotkar

TCIS, Hyderabad

It is known that a divergence in channel flow dramatically destabilizes it while a convergence stabilizes it. What is the net effect of periodic convergent-divergent sections in a plane channel? Can this effect be explored for engineering applications such as in microfluidics? The initiation of the transition to turbulence is investigated in a wide range of wall-bounded flows including the classical Jeffery-Hamel flow. Linear modal and non-modal stability results will be discussed, to predict the first departure from a steady laminar state. Modal and non-modal mechanisms cause disturbance growth in very different ways, which will be described.

Lastly, a short study is carried out on viscosity-stratified evaporative film flow down an inclined plane to understand the effect of the various parameters involved, which include Marangoni number, evaporative flux, viscosity stratification, surface tension, angle of inclination of the solid plane and the Schmidt number. It is a first step towards understanding the physically intriguing yet poorly understood phenomenon of 'tears of wine' formation.

Wednesday, Apr 20th 2015

12:00 PM (Tea/Coffee at 11:45PM)

Seminar Hall, TCIS