ICTS Skype Seminar

Title : Stability and instability criteria for the 2D alpha Euler equations

Speaker : Shibi Vasudevan, University of Missouri, USA

Date : Friday, January 6, 2017

Time : 10:00 AM

Venue : Amal Raychaudhuri Room, ICTS Campus, Bangalore

Abstract : We present versions of classical stability theorems in the context of the two dimensional alpha Euler equations. These include the Rayleigh and Fjortoft criteria for instability and the celebrated Arnold theorems for stability. The alpha Euler equations arise as an inviscid regularization of the Euler equations of ideal incompressible fluid. The regularization and an additional boundary condition lead to a different spectral problem compared to the Euler equations. We also present a unified treatment of the Arnold stability theorems for various domains such as multiply connected domains, the periodic channel and the two dimensional torus. Differences and similarities with the corresponding stability and instability results for the Euler equations will also be explored via a few examples. Also, we will sketch an outline of a new proof of a recent Zhiwu Lin's instability theorem that gives a sufficient condition for existence of an isolated unstable eigenvalue of the operator obtained by linearizing Euler equations about the steady state solution.