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ICTS Synopsis Seminar

Title : Stability studies of inviscid shallow water flows on a sphere

Speaker : Mukesh Singh Raghav (ICTS-TIFR, Bengaluru)

Date : Friday, 25 April 2025

Time : 10:30 AM (IST)

Abstract : Geophysical flows are commonly studied using shallow water equations under β -plane approximation, which support zonally propagating equatorially trapped waves. There is a lack of comprehensive understanding of effects of shear on these waves. Additionally, the suitability of β -plane approximation has not been systematically addressed.

In this talk, I will address the effects of mean shear on waves and limitations of β -plane by contrasting the eigenfrequency and equatorial trapping of modes between equatorial easterly and westerly profiles.

Next, I will discuss the non-normal growth of the system. In contrast to β -plane, the non-normality of the governing operator on the sphere enables the system to exhibit significant non-normal growth. I will discuss the growth and structure of optimal initial conditions responsible for growth in different configurations on the sphere. Finally, I will briefly discuss some features of the non linear evolution of these states.

Venue : Online

Zoom Link: <https://icts-res-in.zoom.us/j/93662524822?pwd=OXnnJgl13w0VNlJAfyeZWxOnKGL6aQ.1>

Meeting ID: 936 6252 4822

Passcode: 202030