PolyU-PDE Seminars

Prof. Di WU

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Topic 1
Linear viscous instability of boundary layer flow

Date| Time
16 October 2024 (Wednesday) | 4:00pm – 5:00pm (HK Time)

Meeting ID | Password
824 1569 3338 | 1016

Zoom Link
https://polyu.hk/UOUKv

Abstract:
The Tollmien-Schlichting (T-S) waves play a key role during the early stage of the boundary layer transition. In a breakthrough work (Duke Math Jour, 165(2016)), Grenier, Guo and Nguyen gave a first rigorous construction of the T-S waves of temporal mode for the incompressible fluid.
In this talk, we show two results about the Tollmien-Schlichting waves: 1. For the incompressible case, we confirm the existence of neutral curve by constructing stable and neutral stable Tollmien-Schlichting waves. 2. We construct the unstable Tollmien-Schlichting waves of both temporal and spatial mode to the linearized compressible Navier-Stokes system around the boundary layer flow in the whole subsonic regime.

Topic 2
Mack modes in supersonic boundary layer

Date| Time
30 October 2024 (Wednesday) | 4:00pm – 5:00pm (HK Time)

Meeting ID | Password
873 0802 9990 | 1030

Zoom Link
https://polyu.hk/lhMPo

Abstract:
Understanding the transition mechanism of boundary layer flows is of great significance in physics and engineering, especially due to the current development of supersonic and hypersonic aircraft. In this paper, we construct multiple unstable acoustic modes so-called Mack modes, which play a crucial role during the early stage of transition in the supersonic boundary layer. To this end, we develop an inner-outer gluing iteration to solve a hyperbolic-elliptic mixed type and singular system.

ALL ARE WELCOME