

CMM PDE Seminar

Speaker: Víctor Cañulef, Postdoc CMM, Universidad de Chile.

Title: On the collapse of the local Rayleigh condition for the hydrostatic Euler equations

Abstract: The hydrostatic Euler equations are derived from the incompressible Euler equations by means of the hydrostatic approximation. Among the different stability criteria that arise in the study of linear stability for the incompressible Euler equations, we can mention Rayleigh's stability criterion, which gives rise to the local Rayleigh condition. Linear and nonlinear instability of the hydrostatic Euler equations around certain shear flows is well-known, as well as the finite time blow-up of certain solutions that do not satisfy the local Rayleigh condition. On the other hand, local existence, uniqueness and stability has been established in Sobolev spaces under the local Rayleigh condition. In this talk I will present new features of the H^4 solution to the hydrostatic Euler equations under the local Rayleigh condition; under certain assumptions, we establish the dichotomy between the breakdown of the local Rayleigh condition and the formation of singularities. Additionally, we get necessary conditions for global solvability in Sobolev spaces. As a byproduct, we show the x -independence of stationary solutions. Our proof relies on new monotonicity identities for the solution to the hydrostatic Euler equations under the local Rayleigh condition.

Monday, June 19, 2023 at 12 Santiago time.

Venue: Online via Zoom / Sala de Seminarios CMM, 7th floor, Beauchef 851

El link para acceder por zoom:

<https://reuna.zoom.us/j/82162057188?pwd=S2Nnd2JHbEJTOFhWYk1R3dBdG1QZz09>

For further information, see our webpage: <https://eventos.cmm.uchile.cl/pdeseminar/>

