basque center for applied mathematics

Scientific Seminar
(APDE – Applied Analysis)

Tuesday, December 4th, 16:00-17:00

Mark Willkinson

Heriot-Watt University (Scotland, UK)

LOCAL-IN-TIME CLASSICAL SOLUTIONS OF THE SEMI-GEOSTROPHIC EQUATIONS IN EULERIAN COORDINATES

We prove the existence of local-in-time smooth solutions of the incompressible semi-geostrophicequations in Eulerian co-ordinates in 3-dimensional smooth bounded simply-connected domains. We achieve our results by appealing to the theory of so-called div-curl systems (or Hodge systems), making use of recent results of Wang, which yield useful estimates on the ageostrophic velocity field. To our knowledge, this work constitutes the first time that any notion of bounded solution of the semi-geostrophic equations in Eulerian co-ordinates has been constructed on a bounded domain. Indeed, our work solves an open problem for classical solutions as highlighted by, among others, A. Figalli in his CIME lectures on the semi-geostrophic equations.

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EXCELENCIA SEVERO OCHOA

matematika mugaz bestalde