Existence for large times of the Navier-Stokes equations in a rotating frame with spatially almost periodic large data

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Wednesday, April 21, 2010

Room: MA 016, Time: 4:00pm

ABSTRACT. We consider existence for the large times of solutions to the Navier- Stokes equations in a rotating frame with spatially almost periodic large data provided by a sufficiently large Coriolis force. The Coriolis force appears in almost all of the models of meteorology and geophysics dealing with large-scale phenomena. To show existence for large times of solutions, we use FM_0 space, i.e. Fourier preimage of the space of all finite Radon measures with no point mass at the origin proposed by Giga, Inui, Mahalov and Matsui in 2005. We do not need to impose smallness condition to the initial data. Existence for large times is proven by means of techniques of fast singular oscillating limits and bootstrapping from a global-in-time unique solution to the limit equations.