

Boundary layer analysis for the fast horizontal rotating fluids

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It is well known that, for fast rotating fluids with the axis of rotation being perpendicular to the boundary, the boundary layer is of Ekman-type, described by a linear ODE system. In this talk, we consider fast rotating fluids, with the axis of rotation being parallel to the boundary. We show that, for certain initial data, the corresponding boundary layer is describe by a nonlinear, degenerated PDE system which is similar to the $2D$ Prandtl system. Finally, we prove the well-posedness of the governing system of the boundary layer in the space of analytic functions with respect to tangential variable.

This is a joint work with Chao-Jiang Xu (Université de Rouen) and Wei-Xi Li (Wuhan University, School of Mathematics and Statistics).