
復旦大學
FUDAN UNIVERSITY

Applied Math
Ph.D. Seminar

# Back flow and blowup of the geophysical boundary layer problem

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**Location:** Rm 1801, Guanghua East Tower

**Abstract:** The proposal of this note is to study the back flow and blowup properties of solution to the geophysical boundary layer problem, which differs from the classical Prandtl boundary layer equations with a nonlocal integral term arising from the Coriolis force. Firstly, we show that the back flow point appears at the physical boundary in a finite time under certain constraint on the growth rate of the tangential velocity when both of the initial tangential velocity and the upstream velocity are monotonically increasing with respect to the normal variable of the boundary, even if the momentum of the outer flow is favorable for the classical Prandtl equations. Moreover, when the monotonicity condition is violated and the initial velocity and outflow velocity satisfy certain condition on a transversal plane, for any smooth solution decaying exponentially in the normal variable to the geophysical boundary layer problem, it is proved that its Sobolev norm blows up in a finite time.