

## **Gevrey-class-3 regularity of an hyperbolic extension of the Prandtl equations**

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For more than a century, the Prandtl theory of boundary layers has inspired many scientific disciplines (such as aerodynamics, automobile design, elasticity, plasticity and rheology). Although the Prandtl equations are nowadays classical, their solutions present a particular unstable nature.

These instabilities are nowadays moderately well understood. From a purely analytic prospective, they reduce the function setting in which the equations are well-posed. More precisely, without any structural assumption, the Prandtl equations are locally well-posed when the initial data are Gevrey-class 2 along the horizontal direction.

The goal of this talk is to present a meaningful physical extension of the Prandtl equations that allows to overcome the barrier given by the Gevrey-2 class. This extension relies strongly on inertial effects of the fluid and we show that its linearization around a shear flow is indeed well-posed with initial data that are Gevrey-class 3 along the horizontal direction (hence less regular than Gevrey 2).

This talk is based on a joint work with J. Kortum (University of Würzburg, Germany) and S. Scrobogna (University of Trieste, Italy).