

# Navier-Stokes equations with incompatible data in the zero viscosity limit

Marco Sammartino<sup>1,\*</sup>, Maria Carmela Lombardo<sup>1</sup>

<sup>1</sup> Dipartimento di Matematica, Università di Palermo, Italy,

\*[marco.sammartino@math.unipa.it](mailto:marco.sammartino@math.unipa.it)

## Abstract

In this talk we shall consider an incompressible flow interacting with a boundary without assuming that the initial datum satisfies the no-slip condition at the boundary. A typical case when this situation occurs is the impulsively started disk. Other instances widely studied in the literature are when a vortical configuration, which is a steady solution of the Euler equations (like the thick core vortex or the vortex array), is assumed to interact instantaneously with a solid boundary. Focusing our analysis on the Navier-Stokes equations on a half-space, we shall construct the initial-boundary layer corrector in the form of a Prandtl solution with incompatible data. This corrector is the first term of an asymptotic series that we shall prove to approximate, in the zero viscosity limit and for a short time, the Navier-Stokes solutions. Assuming analytic regularity in the tangential direction, we shall prove that this time does not depend on the viscosity.