# On the inviscid limit of 2D boundary layer detachments

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Whether Leray-Hopf solutions converge in the inviscid limit to a strong Euler solution in the presence of boundaries is a long-standing open problem. We propose a new flow configuration on a 2D periodic channel with no-slip boundaries. In this configuration, analytical initial conditions have a Reynolds-dependent boundary layer, whose thickness scales as in the Prandlt boundary layer theory. Detachments are expected due to adverse pressure gradients, and the associated Prandtl equation is known to blowup in a finite time. Nevertheless, the initial conditions converge in L2 norm to an analytical stationary Euler solution. By means of high resolution direct numerical simulations, we study the Navier-Stokes solutions with increasing Reynolds numbers. Invoking rigorous conditional statements (Kato-like convergence theorems), and analyzing the driving scales of the flow, we consider whether or not the Navier-Stokes solutions converge to the stationary Euler solution in the inviscid limit, and how this relates with a turbulent state after the boundary layer detachments. This is an ongoing work in collaboration with Jérémie Bec.