# Coherent dynamics in wall turbulence

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**Abstract**

It is of this paper the goal to study the turbulent wall
where structures abound whose effect is profound
even though their size is small.

It will thus first be shown that the wall can survive on its own
without any interaction, save perhaps in the form of a passive reaction,
with the turbulent flow higher on.

What makes this wall layer unique is a steady nonlinear streak
which cycles chaotically while deforming locally,
and which organises into objects of much larger sizes.

The rest of this paper is concerned with it.

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*In turbulence near to a wall,*
*There are structures much longer than tall;*
*With the breakdown of streaks,*
*The vorticity peaks;*
*And the speed can slow down to a crawl.*

## 1. Introduction

Walls are present in most flows and profoundly influence turbulence. That makes wall-bounded turbulence an interesting physical phenomenon, and one of prime technological importance. Wall-bounded flows are responsible for most of the drag of moving vehicles, as well as for a substantial part of aerodynamic noise, and it is also through walls that heat is transferred into the fluid and that aerodynamic loads are imposed on structures. We shall see that many issues in these flows are still open, and that they differ in many ways from the isotropic and homogeneous turbulent case.