

Abstract Submitted
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Study of interacting shear layers in the formation of grid turbulence JOSE IGNACIO CARDESA-DUENAS, TIMOTHY NICKELS, University of Cambridge — Grid turbulence has been studied for many years as a method of producing approximately homogeneous isotropic turbulence to test classical theories. These studies have concentrated on the region well downstream of the grid since this is where the turbulence is supposed to take its classical form. The way in which the turbulence develops to this state from what is essentially the merged wakes of a series of rods is not yet well understood. This has particular implications as to the extent to which the turbulence downstream is independent of the grid's geometry. A related question is to what extent inhomogeneity due to the grid persists downstream. In order to study these questions, we fully map the first 15 mesh lengths in the wake of two different static biplanar grids using 2D high-speed PIV. This is done with 3 cameras to cover a large field of view in the downstream direction with adequate resolution. Measurements are taken for each grid at three different Reynolds numbers (Re_M up to 16 000) and on two different planes with respect to the grid: half way between two rods and exactly behind a rod.

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