

Abstract Submitted  
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**An experimental observation of a turbulence regeneration mechanism in pipe flow** BJORN HOF, JERRY WESTERWEEL, Delft University of Technology — We report an experimental investigation into the structure of turbulent pipe flow. With the aid of a high speed stereoscopic PIV system we were able to confirm and extend our previous observation of recurring travelling wave transients in pipe flow. Within the turbulent flow we have identified a turbulence regeneration cycle underlying the observed wave transients. The cycle involves vortices of a streamwise orientation and a wavy instability of low speed streaks. This observation is in excellent agreement with predictions from theoretical models where it has been suggested that this cycle is a key mechanism in sustaining turbulence in shear flows. The periodicity of the cycle observed in the experiment is in close agreement with that observed in numerical calculations.

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