

Abstract Submitted  
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**Multi-structure turbulence in a boundary layer interacting with a uniformly sheared flow.**<sup>1</sup> STAVROS TAVOULARIS, CURTIS LIVINGSTON, University of Ottawa — Turbulence generated by two or more distinct production mechanisms and having two or more types of large-scale structure has been termed multi-structure. Depending on the conditions, such flows may retain a non-canonical character or relax to a canonical flow. This study investigates a case in which both production mechanisms persist as the flow evolves. It examines the multi-structure-turbulence region of a turbulent boundary layer (TBL) developing along a smooth wall in a water tunnel, while being adjacent to a nearly homogeneous, uniformly sheared flow (USF). Detailed measurements are collected with laser Doppler velocimetry, particle image velocimetry and hot film anemometry. The mean shear and the turbulent shear stress change direction from the TBL to the USF and vanish near the TBL edge. The statistical properties of the turbulence in the multi-structure region have been measured and compared to those in canonical TBL and USF. Particular interest focusses on the variation of the dissipation parameter across the flow and the shapes and orientations of the coherent structures in the multi-structure region.

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