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Evolution of the mean dynamics of a shear-wake flow MARC BAMBERGER, JOSEPH KLEWICKI, University of New Hampshire — A shear-wake flow forms in the post-separation region downstream of a splitter plate dividing two boundary layer flows that have different freestream velocities. Thus, the upstream (in-flow) condition for the shear-wake is a wall-bounded flow, while the downstream (out-flow) state is a two-stream shear layer. Recent studies have revealed that the mean momentum equation of the turbulent boundary layer admits a four layer structure, and that in three of these layers the mean viscous force (gradient of the mean viscous stress) is of leading order. Conversely, the mean dynamics of the two stream shear layer are dominated by inertial terms (mean advection and Reynolds stress gradient). In this presentation we report on an experimental investigation of the evolution of the mean dynamics of a shear-wake flow. Single and x-array hotwire measurements are acquired in a relatively large scale shear layer facility at a velocity ratio of two. Special attention is given to better understanding the processes leading to the attenuation of the viscous force to lower order, and the evolution of a two-signed mean vorticity distribution to one that contains a single sign.

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