

Abstract Submitted  
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**The laminarescent region in the quasi-laminarization process: a vorticity dynamics perspective**<sup>1</sup> GUILLERMO ARAYA, DANIEL RODRIGUEZ, CARLOS QUINONES, University of Puerto Rico Mayaguez — Incompressible turbulent boundary layers subject to severe acceleration or strong Favorable Pressure Gradient (FPG) might experience a quasi-laminarization or a reversion process characterized by a meaningful depression of Reynolds shear stresses and reduction of turbulent production attributed to the dominance of pressure forces. Direct Numerical Simulation (DNS) of highly accelerated turbulent boundary layers is performed in order to shed some light on the energy redistribution, transport phenomena and vorticity dynamics of the laminarescent stage during the quasi-laminarization process. This region is one of the constituents of The Island of Ignorance according to Sreenivasan [Acta Mech. 44, pp1-48, 1982]. In a recent article by Araya, Castillo and Hussain [Journal of Fluid Mechanics, 775, pp189 - 200, 2015], DNS of an initially fully turbulent flow subjected to a very strong FPG has shown reduction of the Reynolds shear stresses with a logarithmic behavior in the meso-layer region, associated with the trend of the wall-normal advection in that region, i.e.  $V^+ \partial U^+ / \partial y^+ \sim 1/y^+$  ( $\sim \overline{\partial u'v'^+} / \partial y^+$ ).

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