

Abstract Submitted  
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**Streamwise evolution of drag reduced turbulent boundary layer with dilute polymer solutions**<sup>1</sup> YASH SHAH, SERHIY YARUSEVYCH, University of Waterloo — The effect of dilute polymer solutions on the evolution of flat-plate turbulent boundary layer has been investigated experimentally. Three different injection concentrations of 100, 500 and 1000 ppm of polyethylene oxide (PEO) were injected through an inclined slot on the plate and particle image velocimetry measurements were performed to characterise boundary layer development and compare the results to the baseline cases without injection and with water injection. Drag reduction (DR) was found to decrease approximately linearly with injection distance for all injection concentrations. The results show that polymer injection has a significant effect on the flow statistics, including the extent of viscous sublayer and the characteristics of the log layer. The polymer injection also attenuates peak velocity fluctuations and moves them away from the wall with increasing polymer concentration. It is also shown that the ejection and sweep motions are weakened notably by polymer injection.

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