

Abstract Submitted  
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**Large field of view multi-resolution experimental measurement of the spatial structure of a high Reynolds number turbulent boundary layer** NICOLAS A BUCHMANN, CALLUM ATKINSON, Monash University, CHARITHA DE SILVA, EBENEZER GNANAMANICKAM, NICHOLAS HUTCHINS, Melbourne University, JULIO SORIA, Monash University, IVAN MARUSIC, Melbourne University — A multiple camera, multiple resolution PIV system consisting of nine high resolution cameras and two dual cavity lasers is used to instantaneously measure a large streamwise, wall-normal field of view ( $2\delta \times 1.5\delta$ ), while simultaneously resolving the near-wall flow down to a height of  $y^+ \approx 3$  at Reynolds numbers of  $Re\tau \approx 8,000$  to  $30,000$ . The high spatial resolution in the near-wall vicinity enables direct estimation of the wall shear stress and allows for subsequent and conditional analysis of both the near-wall and larger outer flow structures and fluctuations. The quality of this measurement is assessed via statistical comparison with previous measurements made using hot-wire anemometry and compared with the highest available Reynolds number DNS. Conditional two-point correlations, and conditional mean structures will be presented.

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