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Space-Time Pressure-Velocity correlations in a high Reynolds number Turbulent boundary Layer YOSHITSUGU NAKA, MICHEL STANISLAS, JEAN MARC FOUCAUT, SÉBASTIEN COUDERT, LML UMR CNRS 8107 — In the present study, we developed an experimental setup for the simultaneous measurements of the fluctuating pressure and the three velocity components in a high Reynolds number turbulent boundary layer. A quantitative measure of the extension of the space-time pressure-velocity correlations is given based on their reconstructed 3D distributions. The correlations between the fluctuating pressure at the wall and in the field and each three velocity components exhibit characteristic behavior. The pu correlation show significant Reynolds number dependence which is less evident for the two other correlations. The wall pressure velocity correlation are significantly different from the field ones. All correlations evidence strong relation of the pressure fluctuations with large scale coherent structures. These relations are significantly different for positive and negative pressure fluctuations at the wall.

Michel Stanislas
LML UMR CNRS 8107

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