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Surface shear stress fluctuations in the atmospheric surface layer JASON MONTY, University of Melbourne, NICK HUTCHINS, IVAN MARUSIC, University of Minnesota, MIN CHONG, University of Melbourne, UNIVERSITY OF MELBOURNE COLLABORATION, UNIVERSITY OF MINNESOTA COLLABORATION — A lightweight, high frequency response ($25Hz$), floating element sensor was used to measure wall shear stress fluctuations in the atmospheric surface layer formed over a salt flat at the SLTEST site, Utah, USA. The sensor uses a laser position measurement system to track the motion of the floating element which consisted of a $50mm$ diameter foam disc, as described by Heuer & Marusic (Meas. Sci. Tech., Vol. 16, 1644- -1649, 2005). The measurements were taken as part of an internationally coordinated experimental program designed to make extensive spatial and temporal measurements of velocity, temperature and wall shear stress of the surface layer. Velocity measurements were made with both a $30m$ high vertical array and a $100m$ wide horizontal array of sonic anemometers; 18 anemometers in total were employed. Cross-correlations of shear stress and streamwise velocity fluctuations were analysed in an attempt to identify structure angles in the flow. The results were also compared with experimental data from controlled, laboratory turbulent boundary layers having three orders of magnitude lower Reynolds number.

Min Chong
University of Melbourne

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