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Adverse Pressure Gradient Boundary Layer Experiments Using Synchronized PIV and a Hot Wire Anemometry Rake¹ P.B.V. JOHANSSON, M. TUTKUN, W.K. GEORGE, Chalmers University of Technology, Dept. of Applied Mechanics, 412 96 Goteborg Sweden, M. STANISLAS, J.M. FOUCAUT, J. KOSTAS, S. COUDERT, Laboratoire de Mecanique de Lille, UMR CNRS 8107, 59655 Villeneuve d'Ascq France, J. DELVILLE, Laboratoire d'Etudes Aerodynamiques, UMR CNRS 6609, 86036 Poitiers France — This is the first report of an adverse pressure gradient turbulent boundary layer experiment performed in Laboratoire de Mécanique de Lille, LML, wind tunnel which is of 20 meter in length. The adverse pressure gradient was created by means of a bump of 30 cm height. The thickness of the boundary layer was about 30 cm and Reynolds number based on momentum thickness, Re_θ , was 30 000 for 10 m/s external free stream velocity. A hot wire rake of 143 probes synchronized and simultaneously sampled together with 2 stereo PIV systems in the wallnormal-spanwise (YZ) plane, 1 cm upstream of the wires plane, and 1 stereo PIV system to record in the streamwise-wallnormal (XY) plane. One high repetition PIV system was used in streamwise-spanwise (XZ) plane with sampling frequency of 3000 VF/s and also at a slower rate simultaneously with hot wire signal.

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