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Exploring a customized Preston tube for boundary layer transition detection

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Abstract. *The flow conditions largely influence boundary layer transition. Several techniques are employed to estimate the transition location, often through the analysis of velocity fluctuations or changes in the mean profile. Therefore, the present study describes the development and characterization of the Preston tube as a transition detection instrument. The Preston tube was originally designed to measure the coefficient of friction. Since this is related to the shear stress, which is related to the derivative of the velocity profile at the wall, the Preston tube can be used to determine the change from laminar to turbulent mean profile. To assess the instrument, we carried out wind tunnel experiments with a flat plate model containing a cavity to induce transition displacement and the results proved the effectiveness of the instrument.*

Key words: *Preston tube. Transition. Boundary layer.*

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