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On the measurement of wall shear stress in turbulent boundary layers GUNNAR JOHANSSON, FARAZ MEHDI, Chalmers University of Technology, JONATHAN NAUGHTON, University of Wyoming — Wall shear stress is an important parameter for turbulent boundary layers, both theoretically and practically. Yet highly accurate measurements have proven to be difficult. In this study, we carry out a comparative study of three methods for its measurement, which are all characterized by being exact in principle: the measurement of the mean velocity gradient at the wall, measurement of all terms in the integrated momentum equation, and the oil film interferometry method. All three methods are applied under identical conditions in a number of stream-wise positions in a wall jet facility. Each of the methods exhibits their own unique difficulties. These difficulties, the resulting inaccuracies and some means to minimize them are discussed.

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