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A Study of Wake Development and Structure in Constant Pressure Gradients (Paperback)

By Flint O Thomas

Biblioscholar, United States, 2013. Paperback. Condition: New. Language: English . Brand New Book ***** Print on Demand *****.Motivated by the application to high-lift aerodynamics for commercial transport aircraft, a systematic investigation into the response of symmetric/asymmetric planar turbulent wake development to constant adverse, zero, and favorable pressure gradients has been conducted. The experiments are performed at a Reynolds number of 2.4 million based on the chord of the wake generator. A unique feature of this wake study is that the pressure gradients imposed on the wake flow field are held constant. The experimental measurements involve both conventional LDV and hot wire flow field surveys of mean and turbulent quantities including the turbulent kinetic energy budget. In addition, similarity analysis and numerical simulation have also been conducted for this wake study. A focus of the research has been to isolate the effects of both pressure gradient and initial wake asymmetry on the wake development. Experimental results reveal that the pressure gradient has a tremendous influence on the wake development, despite the relatively modest pressure gradients imposed. For a given pressure gradient, the development of an initially asymmetric wake is different from the initially symmetric wake. An explicit similarity solution for the...



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