It does present a practical approach to the solution of single input-single output feedback problems. This does not particularly recommend the book as an undergraduate text since one is usually trying to accomplish considerably more than that in such a class. This ad hoc practical approach is divorced from the context of general dynamical systems. The revolutionary aspect is not revolutionary at all. Classical control theory can be described as being a collection of methods for establishing the behavior of systems without solving the differential equations of motion. If you agree that direct solution of the system equations of motion is a practical method of investigating control system designs then you will probably agree with Phelan that classical control theory is sophistry.

The author emphasizes the importance of final control element saturation. This point is certainly overlooked in most texts. Not only do texts on linear theory omit mathematical consideration of hard limits, they fail to warn the fledgling designer to check the magnitudes of intermediate variables during typical transients. The author overstates the importance of another warning: namely, the need to prevent reset-windup, but that is less of a sin than to omit mention of it in an avowedly practical book. Texts which deal with such topics usually apply describing functions to extend linear methods to accommodate these simple nonlinearities.

In recent years, great strides have been made in the field of laser doppler anemometry (LDA), attracting an increasing number of fluid mechanics researchers. Some have been lured by the unique capabilities of this method of flow measurement, only to discover that considerable expertise is needed to sidestep fallacies arising from lack of understanding of the optics and electronics of the complete measuring system. Consequently, it would seem that the most suitable sort of book on this subject would have to incorporate survey articles to orient the novice, some specialized papers to aid those already involved in measurements, and a selection of papers describing a variety of actual LDA setups. From the perspective of this reviewer (a novice in the field of LDA), all of these objectives have been achieved.

The reader will find the survey articles of F. Durst (who was involved in contributing five papers to this book) on electronic processing of optical anemometer signals and of W. K. George, Jr. on accuracy limitations inherent in the laser doppler signal to be so well written that little, if any, prior experience with LDA is necessary for easy comprehension of the material. Newcomers to LDA will find the paper of F. Durst and W. H. Stevenson on the use of Moire patterns for visually modelling laser doppler signals to be particularly helpful.

A number of more specialized, but equally worthy, papers treat topics such as velocity biasing, particle concentration effects, noise effects, and various means of processing the laser doppler signal. Measurement of liquid-gas two phase flow is treated in several papers. Finally, a selection of twenty-two applications of LDA provides the reader with a series of diverse case studies that will make his own experiment more solidly based. It would be hard to imagine any worker in the field of LDA not having access to this work.


**REVIEWED BY DONALD ROCKWELL**

The need for a comprehensive book on unsteady flow measurement would not be disputed by workers in fluid mechanics, who have recently witnessed both the appearance of increasingly sophisticated experimental techniques and the change in perspective of studying unsteady turbulent flows from a "random" to "organized" viewpoint.

This book contains a collection of diverse articles of varying depth and quality. Near the beginning of the text an attempt was made to write an introduction to the theory of unsteady flows in a space of nine pages. Success in such an endeavor requires concentrated description of theoretical concepts coupled with extensive references. Instead, no such references are offered, and the reader is confronted with the paragraph "One sometimes hears about the stability of unsteady flows, but it is not easy to define such a concept without a rigorous mathematical formulation". Pity the novice who interprets this as a passing rumor. (Stability of perturbed turbulent flows has been studied by Hussain and Reynolds and Schachenmann and Rockwell.)

In subsequent chapters, the following measurement topics are well treated: unsteady pressures, forces, and accelerations; heat transfer, skin friction, total temperature, and concentration; gas density; and combustion parameters. Velocity measurement techniques of hot wire (and hot film) anemometry and laser anemometry are described in separate chapters. Not only does G. Comte-Bellot provide an extensive review of the former anemometry technique, but also briefly compares it with the latter technique.

The experimentalist will also greatly benefit from chapters on analog and digital storage and display systems, implementation of digital systems for signal analysis, space-time correlations, and conditional sampling.

On the whole, this book will be of considerable value to both newcomers and to active workers in this area who would like to justify the accuracy of their technique, or to use the detailed bibliographies to help them select an alternate technique.

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