Analysis of observed chaotic data /

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Monografía

This book develops a clear and systematic treatment of time series of data, regular and chaotic, that one finds in observations of nonlinear systems. The reader is led from measurements of one or more variables through the steps of building models of the source as a dynamical system, classifying the source by its dynamical characteristics, and finally predicting and controlling the dynamical system. The text examines methods for separating the signal of physical interest from contamination by unwanted noise, and for investigating the phase space of the chaotic signal and its properties. The emphasis throughout is on the use of the modern mathematical tools for investigating chaotic behavior to uncover properties of physical systems. The methods require knowledge of dynamical systems at the advanced undergraduate level and some knowledge of Fourier transforms and other signal processing methods. The toolkit developed in the book will provide the reader with efficient and effective methods for analyzing signals from nonlinear sources; these methods are applicable to problems of control, communication, and prediction in a wide variety of systems encountered in physics, chemistry, biology, and geophysics

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