

1. Record Nr.	UNINA9910299475403321
Titolo	Cyclostationarity: Theory and Methods // edited by Fakher Chaari, Jacek Lekow, Antonio Napolitano, Andrea Sanchez-Ramirez
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2014
ISBN	3-319-04187-8
Edizione	[1st ed. 2014.]
Descrizione fisica	1 online resource (189 p.)
Collana	Lecture Notes in Mechanical Engineering, , 2195-4356
Disciplina	620
Soggetti	Machinery Engineering design Machinery and Machine Elements Engineering Design
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	<p>""Contents""; ""Introduction""; ""Part I Theory of Cyclostationarity""; ""1 Time-Angle Periodically Correlated Processes""; ""1 Introduction""; ""2 Time Versus Angle Periodicity ""; ""2.1 Problem Statement""; ""2.2 Time-Angle Autocorrelation Function ""; ""3 Models of Time-Angle Periodically Correlated Processes""; ""4 The Frequency-Order Spectral Correlation""; ""4.1 Definitions ""; ""4.2 Estimation Issues""; ""5 Example of Application""; ""6 Conclusion""; ""A.1 Proof of Eq. (17)""; ""A.2 Symmetric Statistics""; ""References""</p> <p>""2 Bootstrap for Maximum Likelihood Estimates of PARMA Coefficients""""1 Introduction""; ""2 Bootstrap Methods""; ""3 Simulation Study""; ""References""; ""3 EM-Based Inference for Cyclostationary Time Series with Missing Observations""; ""1 Second-Order Cyclostationary Time Series""; ""2 Likelihood Based Inference for Cyclostationary Time Series""; ""3 ECM-Type Algorithms in Likelihood-Based Inference for Second-Order Cyclostationary Time Series with Missing Observations""; ""4 Simulation Study""; ""5 Appendix""; ""References""</p> <p>""4 Subsampling for Weakly Dependent and Periodically Correlated Sequences""""1 Introduction""; ""2 The Model""; ""3 Central Limit Theorem""; ""4 Consistency of the Subsampling""; ""5 Conclusions""; ""References""; ""5 Structure of PC Sequences and the 3rd Prediction</p>

Problem"; "1 Introduction"; "2 Angles and Bases"; "3 Structure of Periodically Correlated Sequences and Its Consequences"; "3.1 Stationary Sequences"; "3.2 Periodically Correlated Sequences"; "4 An Application to the 3rd Prediction Problem"; "References"
 "6 Methods of Periodically Correlated Random Processes and Their Generalizations"
 "1 Introduction"; "2 Periodically Correlated Random Processes and Their Generalizations as Probabilistic Model of Stochastic Oscillations"; "3 Estimation of Probabilistic Characteristics of Oscillations"; "4 Detection of Hidden Periodicities"; "5 Conclusions"; "References"; "7 Simulation Comparison of CBB and GSBB in Overall Mean Estimation Problem for PC Time Series"; "1 Introduction"; "2 Block Bootstrap Methods"; "3 Simulation Study"; "References"
 "Part II Applications of Cyclostationarity"
 "8 Modeling of Gear Transmissions Dynamics in Non-stationary Conditions"; "1 Introduction"; "2 Overview on Gear Dynamics Modeling"; "3 Modeling of Non-stationary Operating Conditions"; "3.1 Start-Up of a Gear Transmission"; "3.2 Shut Down of a Gear Transmission"; "3.3 Time Varying Loading Conditions"; "4 Case Study: Wind Turbine Modeling"; "5 Conclusion"; "References"; "9 Effects of Satellite Motion on the Received Signal in GPS"; "1 Introduction"; "2 Satellite Orbit"; "3 Propagation Channel"; "4 Transmitted Signal"
 "4.1 Signal Model"

Sommario/riassunto

In the last decade the research in signal analysis was dominated by models that encompass nonstationarity as an important feature. This book presents the results of a workshop held in Grodek—Poland in February 2013 which was dedicated to the investigation of cyclostationary signals. Its main objective is to highlight the strong interactions between theory and applications of cyclostationary signals with the use of modern statistical tools. An important application of cyclostationary signals is the analysis of mechanical signals generated by a vibrating mechanism. Cyclostationary models are very important to perform basic operations on signals in both time and frequency domains. One of the fundamental problems in diagnosis of rotating machine is the identification of significant modulating frequencies that contribute to the cyclostationary nature of the signals. The book shows that there are modern tools available for analyzing cyclostationary signals without the assumption of gaussianity. Those methods are based on the ideas of bootstrap, subsampling and Fraction-of-time (FOT) models. The book is organised in two parts. The first part will be dedicated to pure theory on cyclostationarity. Applications are presented in the second part including several mechanical systems such as bearings, gears, with or without damages.