

1. Record Nr.	UNINA9910830132303321
Titolo	Normal modes and localization in nonlinear systems // edited by Alexander F. Vakakis [and three others]
Pubbl/distr/stampa	New York, New York : , : Wiley, , [1996] ©1996
ISBN	1-281-76444-2 9786611764449 3-527-61786-8 3-527-61787-6
Descrizione fisica	1 online resource (570 p.)
Collana	Wiley series in nonlinear science
Disciplina	531/.32
Soggetti	Vibration Nonlinear systems
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 (pages [517]-547) and index.
Nota di contenuto	NORMAL MODES AND LOCALIZATION IN NONLINEAR SYSTEMS; CONTENTS; Preface; Acknowledgments; CHAPTER 1 Introduction; 1.1 Concepts of Nonlinear Normal Mode (NNM) and Nonlinear Localization;; 1.2 Example: NNMs of a Two-DOF Dynamical System;; CHAPTER 2 NNMs in Discrete Oscillators: Qualitative Results; 2.1 Preliminary Formulation;; 2.2 Existence Theorem for NNMs;; 2.3 Applications of the Existence Theorem;; 2.4 NNMs in Systems with Concave and Convex Nonlinearities;; CHAPTER 3 NNMs in Discrete Oscillators: Quantitative Results; 3.1 Introduction;; 3.2 Conservative Systems, 3.2.1 Trajectories of NNMs in Configuration Space,3.2.2 Similar NNMs;; 3.2.3 Nonsimilar NNMs and Matched Asymptotic Expansions;; 3.2.4 Application to a Two-DOF Strongly Nonlinear System;; 3.3 Invariant Manifold Approaches for NNMs;; 3.4 Analysis of NNMs Using Group Theory;; 3.5 Vibro-Impact Systems;; CHAPTER 4 Stability and Bifurcations of NNMs; 4.1 General Stability Results;; 4.2 Similar NNMs;; 4.2.1 Analysis of Stability Boundaries;; 4.2.2 Finite-Zoning Instability Conditions;; 4.3 Nonsimilar NNMs;; 4.4 NNM Bifurcations in a System in Internal Resonance;; 4.5 Stability of Stationary Waves,

CHAPTER 5 Resonances of Discrete Systems Close to NNMs 5.1 Exact Steady State Motions;; 5.2 Admissible Forcing Functions for Steady State Motions;; 5.3 Effects of NNM Bifurcations on the Resonances;; CHAPTER 6 The Method of Nonsmooth Temporal Transformations (NSTTs);; 6.1 Preliminaries;; 6.2 Representations of Functions Using NSTTs;; 6.3 Analysis of Dynamical Systems;; CHAPTER 7 Nonlinear Localization in Discrete Systems; 7.1 Weakly Coupled Oscillators: Qualitative Results;; 7.1.1 Existence and Stability of Periodic Solutions;; 7.1.2 Nonlinear Mode Localization, 7.2 Mode Localization in Systems with Cyclic Symmetry, 7.2.1 Asymptotic Analysis of Modal Curves;; 7.2.2 Transition from Localization to Nonlocalization;; 7.3 Mode Localization in a Strongly Nonlinear System;; 7.4 Localization in Impulsively Forced Systems;; CHAPTER 8 NNMs in Continuous Systems; 8.1 Systems of Finite Spatial Extent;; 8.1.1 Direct Analysis of the Equations of Motion;; 8.1.2 Analysis by Discretization;; 8.1.3 Stability Analysis of NNMs;; 8.2 Systems of Infinite Spatial Extent;; 8.2.1 Stationary Waves as NNMs, 8.2.2 Waves in Attenuation Zones of Monocoupled Nonlinear Periodic Systems, CHAPTER 9 Nonlinear Localization in Systems of Coupled Beams; 9.1 Theoretical Analysis;; 9.1.1 Nonlinear Mode Localization: Discretization;; 9.1.2 Passive Motion Confinement of Impulsive Responses;; 9.1.3 Nonlinear Localization of Forced Steady-State Motions;; 9.1.4 Nonlinear Mode Localization: Direct Analysis of the Equations of Motion;; 9.2 Experimental Verification;; CHAPTER 10 Nonlinear Localization in Other Continuous Systems; 10.1 Multispan Nonlinear Beams;; 10.1.1 Derivation of the Modulation Equations, 10.1.2 Numerical Computations,

Sommario/riassunto

This landmark book deals with nonlinear normal modes (NNMs) and nonlinear mode localization. Offers an analysis which enables the study of various nonlinear phenomena having no counterpart in linear theory. On a more theoretical level, the concept of NNMs will be shown to provide an excellent framework for understanding a variety of distinctively nonlinear phenomena such as mode bifurcations and standing or traveling solitary waves.
