"Vibrations control of the dynamic systems"
(Romanian title: "Controlul vibratiilor unor sisteme dinamice")

By Marcel MIGDALOVICI (Institute of Solid Mechanics of the Romanian Academy) and Daniela BARAN (National Institute for Aerospace Research "Elie Carafoli")

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The book deals with the study of some dynamic systems. The authors define the dynamic system as a structure whose state evolves in time and can be described by means of a generalized coordinates system in an appropriate mathematical model. The evolving structures falling into this category are of great diversity: biological, economic, physical, chemical, mechanical, etc.

The paper focuses on deterministic dynamic systems.

The work also uses the notion of stability with Liapunov meaning. The book consists of eight chapters.

The first chapter presents the mathematical modeling and experimental analysis related to the vibration control of open lines. The dynamic system is described by a conductor embedded at the ends of an opening on the support pillars, fitted with Stockbridge- type anti vibrators.

An original definition for the concept of conductor, derived from the basic notion of Euler-Bernoulli is utilized the authors.

Chapter two defines the dynamic system consisting of a thin curved plate. Goldenweizer's model of linear-elastic thin plate is analyzed. First a static modeling is run continued with a dynamic modeling.

The applications refer to thin curved rotation plates, such as hyperbolic cooling towers.

Chapter three analyzes the stability of motion of a moving vehicle on a road suspended on supporting pillars. The chapter is very interesting due to the mathematical modeling and also to the stability analysis practical mode.

Chapter four is intended to the study of pantograph-catenary wire dynamic system utilizing an original modeling and stability analysis method. The physical model of the dynamic system can be substituted with an equivalent physical model in which the displacement of the pantograph oscillating system is replaced by the catenary wire movement while the oscillating system preserves its position.

Chapter five describes the use of the finite elements method as a procedure of analysis and control for a dynamic system. The method bases are presented and the convergence of the solution obtained by the finite element method is analyzed. A series of applications of the method are also included.

Chapter six examines a number of theoretical results related to the matrix approach of the differential equation systems with periodical coefficients. A number of results obtained by Floquet in the analysis of the dynamic systems stability are included in this chapter.

Several matters of stability within the dynamics of mechanical systems are discussed in **chapter seven**. For a continuous dynamical system are set forth the existence, uniqueness and prolongability theorems. For linear systems with periodic coefficients are given some stability criteria and are shown some of Floquet's results. At the end of the chapter the case of Mathieu's equation is described.

Chapter eight examines two cases when dynamic systems modeling those phenomena are characterized by a strong dependence on initial conditions, by a complex representation in the phase plane, or by the existence of solutions with very long periods often infinite. Both examples refer to the modeling analysis of buckling phenomena. The first is a buckled bar, driven by a periodic lateral force.

The main characteristics of the model are similar. The small differences between equations also induce differences between the solutions of these equations, highlighted by Melnikov' function and Liapunov's exponents.

The second example discussed is the nonlinear panel flutter: a flat plate in parallel current driven by strong axial force.

Using the maximum Liapunov exponent the results from the specialty literature can be found and the regions in the parameter plane where the system is characterized by a strong stability can be detected.

The book has a high scientific level and is a very useful documentary source for those interested in dynamic systems vibrations.

Reviewer:
PhD. Eng. Marcel STERE
Aerospace Consulting