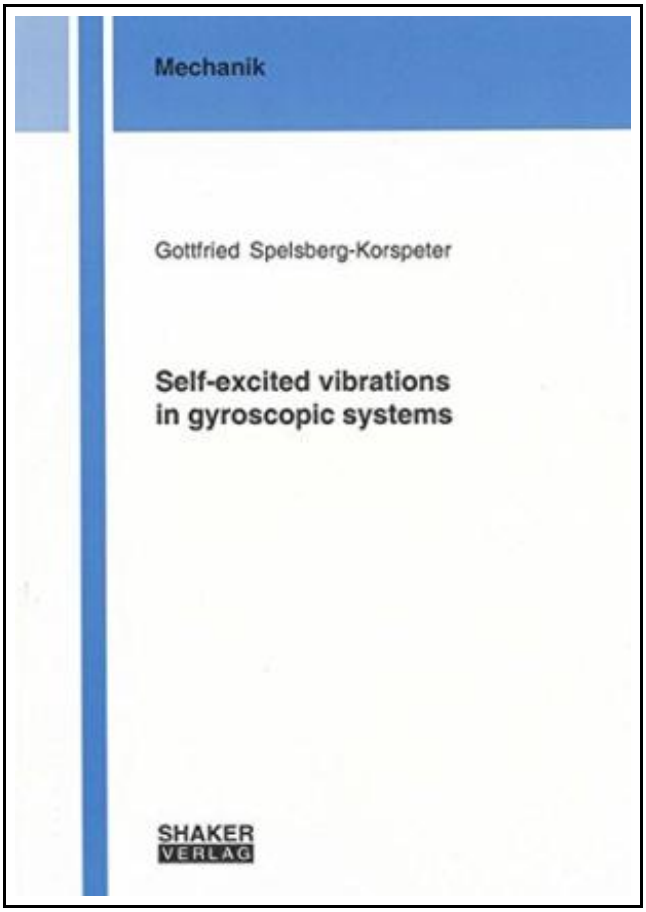
Self-excited vibrations in gyroscopic systems



Filesize: 2.37 MB

Reviews

This ebook is very gripping and fascinating. Sure, it is engage in, nevertheless an amazing and interesting literature. It is extremely difficult to leave it before concluding, once you begin to read the book.

(Ms. Ora Buckridge)

SELF-EXCITED VIBRATIONS IN GYROSCOPIC SYSTEMS

To get **Self-excited vibrations in gyroscopic systems** PDF, remember to refer to the button below and save the document or get access to other information which might be in conjuction with SELF-EXCITED VIBRATIONS IN GYROSCOPIC SYSTEMS book.

Shaker Verlag Dez 2007, 2007. Taschenbuch. Book Condition: Neu. 211x149x4 mm. Neuware - Self-excited vibrations are an unwanted phenomenon in many technical applications. Frequently they occur in moving media that are in frictional contact with other structures. Important examples for these kind of structures are moving belts, band saws, disk brakes, clutches and many more. The aim of this thesis is to make a contribution towards a convenient mathematical treatment of these problems. In a first part of the thesis linear discrete gyroscopic systems under the influence of nonconservative forces are studied. Following ideas of Seyranian and his coworkers perturbation theory is applied in order to obtain analytical approximations to the stability boundaries of these kinds of systems. The subsequent chapters of the thesis deal with the introduction of frictional contact into continuous models originating from the theory of elasticity. As a preliminary example an elastic rod is considered to prepare the derivation of the equations of motion using variational principles in the context of non material transition conditions originating from the frictional contact. The following chapter deals with a moving beam sliding through frictional pins. The equations of motion are derived from the basics of the theory of elasticity yielding a boundary value problem and a discretization approach for numerical calculations. Inspection of the equations of motion yields a mathematical and a mechanical explanation for the occurrence of self-excited vibrations. Using a perturbation approach stability boundaries for the system are considered and results are discussed in the context of Arnold's singularity theory. The next system under consideration is rotating Kirchhoff plate in frictional contact with idealized friction pads. The methods developed for the moving beam are extended to the rotating plate and in particular the coupling of in- and out-of-plane vibrations is discussed. Furthermore the influence of nonlinearities of...

See Also