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Evaluation of Energy Dissipated in Case of Rubber Antivibrating Elements Subjected to a Dynamic Harmonic Regime

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As a function of the internal structure of the vulcanized rubber, strengthened with black carbon, experimentally has been stated that the internal dissipated energy has high values leading to rubber degradation, while subjected to both permanent static and harmonic dynamic load. The tests have been performed under laboratory conditions upon a specialized stand so that natural scale antivibrating elements have been subjected to 20 KN dynamic forces and 50 Hz vibration frequency. In order to obtain compression, shear and compression-shear load, the location angle of the antivibrating elements has been discretely changed. Finally, a calculus model having the viscous nonlinear dumping written in terms of a power seria has been established in order to put into evidence both the high order harmonics excitation related to the imposed fundamental dynamic perturbing pulsation and the evaluation of the internal energy corresponding to high order harmonics. Also must be mentioned that the dissipated energy due to the high order harmonics is higher than the energy corresponding to the imposed fundamental dynamic perturbing harmonic, thus showing the accelerated rubber degradation.

Chaotic Behavior of Helical Gear-Pair Systems Non-Linear Parametrically Excited

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The increased interest for improved gear design has led to extensive research into the field of non-linear dynamics of such systems. The paper reveals a complex dynamic model to study the chaotic behavior in a gear-pair system. In many applications including turbo machinery, machine tools and diesel engines non-linearity's are present due tooth stiffness and damping that induced micro-vibrations of parametric type. In the mean time the input link of the drive ax and the output link of the driven ax induce non-linearity's. Therefore the paper presents the use of Lyapunov exponents method in order to analyze the trend to chaos of such systems. With this method it was found out a strange attractor and it was computed a Poincaré section of the non-linear dynamic response. By this way the paper reveals the chaotic behavior of gear-pair due to: non-linearity's of the input-output linkages and self-induced parametric excitations, caused by the tooth stiffness and damping.

Acoustical Tube with Multiple Side Branches

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It is widely accepted that in the case of a cylindrical tube, in which an acoustic pressure wave propagates, the existence of a lateral side branch produces an acoustic filter in the low frequency range. It is thus possible to reduce the intensity level for the passing away wave the derivation section. The problem presented in this paper represents the beginning of our researches in this field and deals with modification of certain spectral components of the acoustic wave propagating in the tube. A limited number of side branches with different characteristics have been used.

On the Vibrations of the Heavy Rigid Elastically Hanged

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We study the vibrations of the heavy rigid elastically hanged. We consider that the weight of the rigid body can not be neglected. The relations will be deduced in plückerian co-ordinates. In the end, we shall consider an example for a better explain.

Some Methods for Decrease the Noise and Vibration Pollution

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The noise and vibrations generated by the vehicles, taking part in the urban traffic are extremely injurious to the man's life and activity. With this in view, we intend the identification of sources of noise and vibrations pollution in the urban traffic, its effects on the inhabitant's life and activity, the determination of the values of characteristic quantities and the indication of the methods for decrease the noise and vibration pollution.

Semi-active Vibration Control Using Balance-Logic Strategy: Modelling and Testing.

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Semi-active devices for vibration control utilizing variable dry friction or magnetorheological dampers are modelled and tested. The control strategy is based on balance logic principle, which is used to minimize the force transmitted through the vibration isolation system. The damping force is controlled so as to cancel the spring force, which is only possible when these forces act in opposite directions. Otherwise, this force must be set to a minimum possible value. The results of numerical simulation and of the test conducted on experimental models show that a successful implementation of this strategy could produce a significant reduction of the system transmissibility.

About of the Distortions of the Wave into Nonlinear Media

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The linear-waves produced from a harmonic source may cross various media with the dimensions greater as the wavelength. If their mechanical properties as elasticity or density are nonlinear dependant from the deforming, may be say that the media have a variable characteristic impedance. As generally well known, the waves become some distortions at the crossing of the nonlinear media. But the highest distortions appear at the crossing of the separation's area between two different media out of which one is nonlinear. The reflection's and refraction's coefficients of the wave are dependent from the ratio between a variable and a constant impedance, respective from the variable coefficients. As consequences, the momentary amount of the reflected and refracted wave is dependent from their momentary value as elastic deformation of the media and in this way appears two stronger nonlineares waves, as refracted and reflected.
Analytically is very difficult, most impossible to solve the propagation's equation of the wave through different nonlinear media in order to show their distortions. The author motivates this fact with the very precise numerical method and show that a little nonlinearity, their influence on the distortion may be negligible, produced large distortions at the separation's surface.

The Arnoldi Test-Analysis Model

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This paper presents the Arnoldi Test-Analysis Model (TAM) used for structural dynamics reduction and correlation. The Arnoldi TAM is computed using Arnoldi vectors instead of eigenvectors in the Modal TAM, without solving the full eigenvalue problem. This TAM has slightly less accuracy than the Modal TAM but increased robustness at a reduced computational cost. Its performance is illustrated by a small numerical example.

Experimental Analyse of the Vibrations Transmitted to Human Body While Using Drill Hammers

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Among the machinery generating occupational diseases due to the vibrations transmitted to human body the portable hand-held construction equipment such as drill hammers and demolition hammers are classified. In order to characterize the level of vibrations transmitted to the human body and the exposure time, in the frame of ICECON Bucharest specific tests upon the hammer manufactured by the British Company Kango have been performed. The measurements have been carried out with the machine operating at rated working parameters, determining the accelerations in the three orthogonal directions defined by x, y and z axes. Aiming measuring the vibrations the Bruel & Kjaer chain has been used and figures illustrate the processed results as well as the permissible vibration limits for different exposure times.

The Analogical and Numerical Process of the Periodical Signals

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The work presents the analysis of the experimental data from an vibratory equipment and their results show the extended possibilities and the accurate using the numerical process. Experimental data can be processed by the analogue computation systems or by the numerical calculation. The advantage of the analogue computation systems is that they are very simple and were tested for a long time , being very well in that way. The numerical computation systems after more accuracy and flexibility using the same equipment.

Non-Linear Stiffness Influences About the Dynamics of the Anti-Vibrational Passive Isolation Systems

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In this paper the authors present an analysis about the influences of the non-linear type stiffness on the dynamic behaviour of the anti-vibrational and anti-seismical passive isolation equipments, with the impact on the dynamic performances of these protection systems. Also, it was analyse and evaluate the static and dynamic characteristics of these systems because it is very important to protect both the human resources, and the equipments, against vibratory pollution or seismical waves.

Properties of Non-propagating Guided Waves in Plates

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Considerable effort is made in the last decades for a better understanding of long range propagation of ultrasonic waves. The guided waves, also known as Lamb waves are of increasing interest in technical applications such as weld or integrity non-destructive control. The present paper emphasizes the importance of a class of guided waves which are not propagating for long distances. These correspond to the so called evanescent waves, which decay relatively close to an existing discontinuity in the propagation path. These waves do not propagate energy but are of considerable importance in analytical approaches. Analysis of a Lamb wave reflection is investigated ignoring and the including the non-propagating waves in the model.

Accidental Degeneracy

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In this paper it is studied the accidental degeneracy in the case of acoustical vibrations which occur into a gas disposed into a rectangular pipe. The equation describing the motion is an eigenvalues equation. The degeneracy does appear because of the action of a symmetry group on the Hamiltonian of the system. If a numerical parameter from the Hamiltonian is adjusted properly then two energetic levels crossed over and thus we have an accidental degeneracy. In the paper it is studied the corresponding symmetry group and it is graphically described.