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About Phenomenon which Appear at Driving Earthmoving Machine on the Irregular Surface

Carmen DEBELEAC

University "Dunarea de Jos" of Galati, Engineering Faculty of Braila, Research Center for Mechanics of the Machines and Technological Equipments, Calea Calarasilor 29, 810017, Braila, Romania, <http://www.ugal.ro>, cbordea@ugal.ro

Gheorghe OPROESCU

University "Dunarea de Jos" of Galati, Engineering Faculty of Braila, Research Center for Mechanics of the Machines and Technological Equipments, Calea Calarasilor 29, 810017, Braila, Romania, <http://www.ugal.ro>, goproescu@ugal.ro

Abstract: - In this work the authors have developed two theoretical models for study of overloads which appear at the wheel-road interface. In present case, these overloads are caused by the vibrations of an earthmoving machine (e.g. loader, dumper) when it is excited by roughness of the irregular surface. With these models were treated two aspects of wheel behaviour, such as non-linear and linear vertical stiffness. The numerical simulation results show that for a low velocity of earthmoving machine, the contact between the wheel and the road is missing and the overload increases with speed and road roughness.

Keywords: wheel-road, spectrum, machine model

Aspects concerning the influence of the self weight over the fundamental eigenfrequency of a slender beam

Cristian DRAGOMIRESCU

*Department of Mechanics, University "Politehnica" of Bucharest
dragom@cat.mec.pub.ro, cristian_dragomirescu@yahoo.com*

Andrei CRAIFALEANU

*Department of Mechanics, University "Politehnica" of Bucharest
craifaleanu@cat.mec.pub.ro, ycraif@yahoo.com*

Valentin CEAUȘU

*Department of Mechanics, University "Politehnica" of Bucharest
ceausu@cat.mec.pub.ro*

Abstract: - The paper studies the influence of the self weight over the fundamental eigenfrequency, of a beam rigidly fixed at one end and free at the other, situated in a vertical plane. Rayleigh approximate method is applied in order to determine, for different values of the slenderness coefficient, the fundamental eigenfrequency when the self weight is considered and when the self weight is neglected. The ratio of the two quantities is represented versus the length of the beam, as well as with respect to the geometrical and material characteristics.

Keywords: vibration, beam

Viscoelastic Systems Intended for Vibration Isolation

Polidor BRATU

*Research Institute for Construction Equipment and Technology – ICECON S.A.,
266 Pantelimon, 021652 Bucharest, Romania, email icecon@icecon.ro*

Abstract: - This paper treats new vibration insulation systems intended for vibrations characterized by low tuning of the eigen frequency. Both the damping and the elastic characteristics are variously presented for the whole system as well as for its component elements. Thus, some practical models designated to attain appropriate performances in vibration insulation intended for equipments inside buildings (e.g. electric generator, air ventilation-conditioning systems) are presented.

Keywords: vibration, passive isolation, elastic system

Comparative Analysis of the Excitation Impulsive Loadings of the Machines Foundations

Adrian LEOPA

*Research Center for Mechanics of the Machines and Technological Equipments
University “Dunarea de Jos” of Galati, Engineering Faculty of Braila, e-mail:
leopa.adrian@ugal.ro*

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Abstract: - Essentially, the analysis of the excitation impulsive loadings of the machines foundations consist actually in establishing the existing connection between the excitation force parameters (amplitude, pulsation) and the vibration parameters (amplitude, pulsation) as a dynamic response if there are known the mechanical characteristics of the oscillating system (mass, the elastic constant and the amortization coefficient). Likewise, a fact of great importance is the oscillating system analysis excited by different types of loadings and the determination of the functions that define the dynamic behavior of the system.

Keywords: machines foundations, pulsations spectrum

Management of data resulted from vibration measurements trough relational databases

Gilbert-Rainer GILLICH

*“Eftimie Murgu” University of Reșița, Romania
P-ta Traian Vuia 1-4, 320085 Reșița, raini@uem.ro*

Viorel – Ionuț BIZĂU

*“Eftimie Murgu” University of Reșița, Romania
P-ta Traian Vuia 1-4, 320085 Reșița, v.bizau@uem.ro*

Nicoleta GILLICH

*“Eftimie Murgu” University of Reșița, Romania
P-ta Traian Vuia 1-4, 320085 Reșița, raini@uem.ro*

Ovidiu VASILE

*“Politehnica” University of Bucharest, Romania
Splaiul Independenței 313, 060042 Bucharest, vasile@cat.mec.pub.ro*

Abstract: - Measurements of natural or manmade vibrations are often done, resulting information directly linked to the vibration parameters (acceleration, velocity, displacement, frequency, etc.) or to the environment (operator, place, time, equipment, meteorological conditions, etc.). Usually the information is stored in files with specific extensions, but it is also possible to use common extensions like .txt or .xls. This approach is practical if the data is used or processed on one or few computers. Even in this case it is not easy to find correlated information in a short time. Databases and especially relational databases offer a strong tool in data management, making the process of searching or selecting easy and fast. An application using relational databases to handle information resulted from vibration measurement, developed by the authors, is presented this paper.

Keywords: relational databases, vibration

Mechanical Vibrations Impact upon the Musculoskeletal System

Silviu Nicolae PLATON

National Institute for Research and Development for Labour Protection, Alexandru Darabont” Ghencea no.35A, sector 6, Bucharest, silviuplaton@yahoo.com

Abstract: - To identify the potential causes of accidents or occupational diseases, the “risk factor” term is more and more frequently used within the literature. Specialists’ tendency to a deep study on the risk factors is perfectly justified when considering the opportunity it offers to set up preventive measures based on the potential risks of accidents or occupational diseases.

The harmful effect of the vibrations represents such a risk factor as they are to be found within the environment where the man lives and works.

The last statement refers to the unanimous recognized fact according to which the vibrations exceeding certain limits of intensity become a biological aggressive factor i.e. a medical and social noxious agent of significant importance in terms of health condition and working capacity.

The action of the vibrations represents a risk factor for the human body and it depends on the characteristic parameters, the level of acceleration (efficient values), frequency contents (spectral analysis), the location of body contact with the vibrations source, (global vibrations, forearm – hand vibrations), the exposure duration.

Keywords: vibrations impact, safety, health

A Physical Model for Composite Sandwich Panels' Behaviour from Acoustic Absorption Point of View

Vasile MOGA

"Politehnica" University of Bucharest, Romania

Splaiul Independenței 313, 060042 Bucharest, vasile_moga2004@yahoo.com

Marius DUMITRAS

"Politehnica" University of Bucharest, Romania

Splaiul Independenței 313, 060042 Bucharest, mdumitras@yahoo.com

Abstract: - The up to now known studies in the field of acoustic diminishing show that the ideal material for acoustic insulation must be made of an infinite number of Helmholtz type resonators which have to work at different frequencies.

The mathematic model, of the absorption coefficient $\langle \alpha \rangle$ of the composite sandwich panels depending on the frequency of the incident sound waves $\langle f \rangle$, the panel thickness $\langle g \rangle$ and the filling factor $\langle u \rangle$ showed that: the response surface $\alpha = \alpha(f, g, u)$ on the interval $f = (2000 - 6300)$ Hz and $g = 70$ mm has a maximum in which the absorption coefficient takes the value $\alpha = 98\%$. The maximum is obtained for $f = 2000$ Hz, $g = 70$ mm and $u = 0.5$.

The very good acoustic insulating characteristics of the sandwich materials with honeycomb core can be explained through the fact that each honeycomb cell acts acoustically as a Helmholtz type resonator.

On the analogy of the sandwich panel with a sound barrier made of a sound absorbing screen with local reaction and a network of resonators we created a physic model for the calculation of the absorption coefficient.

Keywords: sandwich panels, absorption coefficient

Reactive Silencer Modeling With Boundary Element Method and Experimental Study

Ovidiu VASILE

"Politehnica" University of Bucharest, Romania

Splaiul Independenței 313, 060042 Bucharest, vasile@cat.mec.pub.ro

Abstract: - This paper investigates the acoustic performance of a reactive silencer using Boundary Element Method analysis and experimental techniques.

Modelling procedures for accurate performance prediction had led to the development of new methods for practical muffler components in design. The transmission loss is more widely used as it can be easily computed with a Boundary Element Method analysis. In the present paper the author present an overview of the principles of Boundary Element Method for predicting the transmission loss (TL) of a muffler with two expansion chamber, the pressure distribution on surfaces of muffler and compared with the acoustic performances of the experimental set up. The predicted results agreed in some limits with the experimental data published in literature.

Keywords: muffler, boundary element method, transmission loss