VIBRATIONS
IN PHYSICAL SYSTEMS

Volume XXIV

Editors

Czesław CEMPEL, Marian W. DOBRY

Poznan 2010

VIBRATIONS IN PHYSICAL SYSTEMS
Vol. 24, 2010

ISBN 978-83-89333-35-3

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Polish Society of Theoretical and Applied Mechanics
Poznan University of Technology, Institute of Applied Mechanics
ul. Piotrowo 3, 60-965 Poznan, Poland, NIP 526-17-23-674

ACCOUNT NUMBER
IBAN PL 58 1020 4027 0000 1402 0312 9962
Bank name PKO BP SA, Oddzial I, Poznan
SWIFT code BPKOPLPW

PUBLISHED AND PRINTED
Agencja Reklamowa COMPRINT
ul. H. Rzepeckiej 26 A, 60-465 Poznan, Poland
Tel. +48 602 26 64 26, e-mail: comprint@data.pl, www.comprint.com.pl

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The volume was published in the cooperation of the Institute of Applied Mechanics at Poznan University of Technology and Polish Society of Theoretical and Applied Mechanics.

This journal has been indexed in the list of Ministry of Science and Higher Education (4 points).

POZNAN UNIVERSITY OF TECHNOLOGY
MECHANICAL ENGINEERING AND MANAGEMENT FACULTY
INSTITUTE OF APPLIED MECHANICS
POLISH SOCIETY OF THEORETICAL AND APPLIED MECHANICS

XXIV Symposium

VIBRATIONS IN PHYSICAL SYSTEMS

2010

XXIV SYMPOSIUM

VIBRATIONS IN PHYSICAL SYSTEMS

Będlewo (near Poznań), May 11-15, 2010

Present edition of Symposium Vibrations in Physical Systems is under auspices of

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Introduction to the Volume XXIV of Collected Papers on Vibrations in Physical Systems

Vibrations, oscillations and waves as physical phenomena are omni-present. They are the sign of life, the sign of the operation of machines and devices and they accompany any production processes. Their effects may be harmful, useful and they may also be a source of information on the technical condition of the supervised machines and devices. Volume XXIV of Vibrations in Physical Systems published every second year deals with these widespread phenomena. It comprises the papers presented by specialists from our country but also from abroad at many sessions of the XXIV Symposium of Vibrations in Physical Systems organized also every second year. The Symposium has been organized since 1960 in Poznan by a branch of the Polish Society of Theoretical and Applied Mechanics and the Institute of Applied Mechanics at Poznan University of Technology.

Topics of the publications relate to a wide range of issues connected with modelling and identification of mechanical systems, their stability and dynamics of mechanical systems as well as physical phenomena such as propagation of acoustic waves, vibrations in solid bodies, vibrations of liquids and mechanical structures.

The monograph comprises also numerously presented publications relating to the issues of dynamics in biological as well as biological and mechanical systems. They mainly concern mechanical properties of a human body and its organs (auditory bones) or parts. Other publications describe the dynamic interaction of power between human and machine (Human – Hand-held Powered Tool) or distribution of power and the energy flow in Human-Machine Systems.

Many of the publications present the results of research carried out through simulation with the application of modern digital technologies worked out for the needs of solving linear and non-linear issues of the dynamics of solid bodies or physical phenomena such as propagation of acoustic waves or complicated structures. The publications comprise the results that are analysed from the point of view of the applied methodology or accuracy of the obtained figures.

There are also quite a few publications devoted to methods of passive, active and semi-active minimizing of vibrations and noise and to modelling of vibrations damping with viscotic damper. The publications concerning dynamic issues also analysed the stability of the tested mechanical systems.

Other significant publications concern the monitoring of technical facilities with the use of the propagation of elastic waves that allow us to detect cracks in the composite structure under the test and to specify their location. They also describe methods of modelling the propagation of waves.

All the papers comprised in this volume have been reviewed by members of the Scientific Committee, and in some cases by specialists outside the Committee, should the issues concern problems outside the scope of knowledge of the Committee members. I would like to thank all those persons who help us review the papers and the published monograph and improve their quality.

Co-editor
Marian W. DOBRY

CONTENTS

INVITED PAPERS

1. **Wiesław OSTACHOWICZ, Paweł KUDELA**..... 15
   STRUCTURAL HEALTH MONITORING BY MEANS OF ELASTIC WAVE PROPAGATION

2. **Bogdan MARUSZEWSKI** 23
   PROFESSOR JAROSŁAW STEFANIAK 1929 – 2008

3. **Marek IWANIEC, Dorota MARSZALIK**..... 29
   VIBRATIONS ANALYSIS OF OSSICLES MECHANISM

4. **Jerzy LEWIŃSKI** 35
   SHAPING OF A HEAD OF CYLINDRICAL PRESSURE VESSEL

PAPERS

1. **Krzysztof ARCZEWSKI, Józef PIETRUCHA**..... 41
   ROOTS OF CHARACTERISTIC EQUATION VERSUS EIGENFREQUENCIES

2. **Jan AWREJCEWICZ, Dariusz GRZELCZYK** 45
   VIBRATIONS OF A MECHANICAL SYSTEM WITH FRICTION CLUTCH

3. **Jan AWREJCEWICZ, Jerzy MROZOWSKI, Krzysztof NASIŁOWSKI, Bartłomiej ZAGRODNY**..... 51
   A STAND FOR FOREARM FLEXOR MUSCLES EXAMINATION

4. **Andrzej BŁAŻEJEWSKI, Tomasz KRZYŻYŃSKI** 57
   MULTI-OBJECTIVE OPTIMIZATION OF THE ACOUSTIC IMPEDANCE DISTRIBUTION FOR ROOM STEADY STATE SOUND FIELD CONDITION

5. **Nadiia BOURAOU, Iuliia KLOFA, Yuri ZSUKOVSKIJ, Eduard KULISH**..... 63
   THEORETICAL BASES OF VIBRATION DIAGNOSTICS OF ANCHOR AGAINST LANDSLIDE CONSTRUCTIONS

6. **Nadiia BOURAOU, Iurii SOPILKA** 69
VIBROACOUSTICAL DIAGNOSIS OF THE CRACK-LIKE DAMAGES OF AIRCRAFT ENGINE BLADES AT THE STEADY-STATE AND NON-STEADY-STATE MODES

7. **Dawid CEKUS, Paweł WARYŚ** 75
THE USE OF GENETIC ALGORITHM FOR IDENTIFICATION OF VIBRATION MODEL ON THE EXAMPLE OF BERNOULLI-EULER BEAM

8. **Bartosz CZECHYRA** 81
OPERATIONAL EXCITATIONS IN EXPERIMENTAL RESEARCH INTO DYNAMICS OF LIGHT RAIL VEHICLES

9. **Bartłomiej DYNIEWICZ, Czesław I. BAJER** 87
NUMERICAL METHODS FOR VIBRATION ANALYSIS OF TIMOSHENKO BEAM SUBJECTED TO INERTIAL MOVING LOAD

10. **Paweł FRITZKOWSKI, Henryk KAMIŃSKI** 93
A DISCRETE ELASTIC-DISSIPATIVE SYSTEM AS A MODEL OF A ROPE

11. **Paweł FRITZKOWSKI, Henryk KAMIŃSKI** 99
REGULAR MOTION OF A HANGING ROPE

12. **Leszek GADOMSKI, Alexander PROKOPENYA** 105
PARAMETRIC OSCILLATIONS OF A TORSIONAL PENDULUM

13. **Zinaida GANKEVYCH, Sergey KUCHER, Pavel BONDAR** 111
COMPENSATIVE CONTROL CHART OF ANGULAR VELOCITY SENSOR ON BASIS OF WAVE SOLID-STATE GYROSCOPE

14. **Dominik GŁOWACKI, Jakub GŁOWACKI, Michał KAWALEC, Józef PIETRUCHA** 117
APPLICATION OF AN OSCILLATING FLAP TO IMPROVE GLIDER AERODYNAMICAL CHARACTERISTICS

15. **Zdzisław GOLEC** 125
PROPERTIES OF RESONANCE-TYPE AND DYNAMIC VIBRATION ELIMINATORS

16. **Juliusz GRABSKI, Jarosław STRZAŁKO, Tomasz KAPITANIAK** 131
DICE THROW DYNAMICS INCLUDING BOUNCING

17. Magdalena GRYGOROWICZ, Marian W. DOBRY, Maciej TABASZEWSKI 137
ENERGY EXPERIMENTAL METHOD VERIFICATION DYNAMICAL MODEL OF HUMAN UNDER WHOLE BODY VIBRATION

18. Rafał HEIN, Cezary ORLIKOWSKI 143
HYBRID REDUCED MODEL OF CONTINUOUS SYSTEM

19. Tadeusz J. HOFFMANN, Marta CHUDZICKA-ADAMCZAK, Radoslaw PYTLIŃSKI 151
NEWTON'S LAW FOR THE POINT PARTICLE WITH CHANGING MASS IN STATIC MOMENT DESCRIPTION

20. Joanna IWANIEC 155
IMAGE NOISE REDUCTION BY MEANS OF EGULARIZATION METHODS – PART I

21. Joanna IWANIEC 161
IMAGE NOISE REDUCTION BY MEANS OF EGULARIZATION METHODS – PART II

22. Marek IWANIEC, Agnieszka MIETŁA 167
VOICE CONTROL

23. Małgorzata A. JANKOWSKA 173
COMPARISON OF THE INTERVAL MULTISTEP METHODS OF ADAMS TYPE ON SOME DYNAMICAL SYSTEMS

24. Małgorzata A. JANKOWSKA 185
INTERVAL MULTISTEP PREDICTOR-CORRECTOR METHODS OF ADAMS TYPE FOR SOLVING THE INITIAL VALUE ROBLEM FOR ORDINARY DIFFERENTIAL EQUATIONS

25. Janusz JANKOWSKI 195
VELOCITY AND ACCELERATION DISTRIBUTION IN THE RELATIVE MOTION

26. Janusz JANKOWSKI, Piotr KĘDZIA 201
EFFECT OF ROTATING DURING THE PENDULUM MOTION

27. Katarzyna JELENIEWICZ, Wiesław NAGÓRKO 207
NON-ASYMPTOTIC MODELLING IN ELASTODYNAMICS OF PERIODICALLY RIBBED PLATE

28. Henryk KAŹMIERCZAK, Tadeusz PAWŁOWSKI, Jacek KROMULSKI 213
A NEW METHOD FOR PROCESS DESCRIPTION OF CONSTRUCTIONAL MATERIALS STRUCTURAL DEGRADATION

29. Krzysztof KĘCIK, Jerzy WARMIŃSKI 221
ANALYSIS OF CHAOTIC AND REGULAR MOTION OF AN TOPARAMETRIC SYSTEM BY RECURRENCE PLOTS APPLICATION

30. Vasyl KONDRAT, Olha HRYTSYNA 227
MECHANICAL AND ELECTROMAGNETIC WAVE INTERACTION IN LINEAR ISOTROPIC DIELECTRICS WITH LOCAL MASS DISPLACEMENT AND POLARIZATION INERTIA

31. Anna KOSIŃSKA, Sławomir KOSIŃSKI..... 233
LOVE WAVES IN PRE-STRESSED YEOH MATERIALS

32. Artur KROWIAK..... 239
BUILT-IN IMPLEMENTATION OF SOME BOUNDARY CONDITIONS FOR VIBRATING SYSTEMS IN THE SDQ METHOD

33. Grzegorz KUDRA, Jan AWREJCEWICZ 245
A WOBBLESTONE MODELLING WITH COUPLED MODEL OF SLIDING FRICTION AND ROLLING RESISTANCE

34. Łukasz LECH, Marek IWANIEC..... 251
THE MEANING OF THE PIEZOELECTRIC AND STREAMING POTENTIAL IN BONE REMODELING

35. Roman LEWANDOWSKI, Bartosz CHORĄŻYCZEWSKI 259
IDENTIFICATION OF PARAMETERS OF THE FRACTIONAL RHEOLOGICAL MODEL OF VISCOELASTIC DAMPERS

36. Wojciech ŁAPKA 265
SUBSTITUTIONAL TRANSMITTANCE FUNCTION OF HELICOIDAL RESONATOR

37. Igor MACIEJEWSKI..... 271
MODELLING AND CONTROL OF SEMI-ACTIVE SEAT SUSPENSION WITH MAGNETO-RHEOLOGICAL DAMPER

38. Adam MARCINIEC, Stanisław NOGA 277
NATURAL FREQUENCIES AND MODE SHAPES OF A COMPOSITE ANNULAR MEMBRANE

39. Waldemar MORZUCH..... 283
DYNAMICS OF A ROTOR OF ASYNCHRONOUS MOTOR LOADED WITH MAGNETIC TENSION AND AXIAL FORCE

40. Waldemar MORZUCH..... 289
DYNAMICS OF A ROTOR OF TWO-POLE ASYNCHRONOUS MOTOR WITH DAMPING

41. Stanisław NOGA..... 295
FREE VIBRATIONS OF AN ANNULAR MEMBRANE ATTACHED TO WINKLER FOUNDATION

42. Paweł OLEJNIK, Jan AWREJCEWICZ..... 301
MAGNETIC LEVITATION OF A LIGHT CYLINDRICAL-SHAPE MASS WITH CONTROL OF DAMPING OF THE TRANSITION-STATE VIBRATIONS

43. Rafał PALEJ 307
EIGENVALUE PROBLEM FOR MULTI-DEGREE-OF-FREEDOM SYSTEMS WITH REPEATED FREQUENCIES

44. Maciej PANEK 313
IDENTIFICATION ON OF THE ELASTO-DAMPING PROPERTIES OF LONG BONES ON A BASIS OF THE DEGENERATE MODELS

45. Sebastian PECOLT, Tomasz KRZYŻYŃSKI 319
MODELLING AND CONTROL OPTIMIZATION OF THE ELECTROMAGNETIC MOTOR USING GENETIC ALGORITHM

46. Dominik PISARSKI, Czesław I. BAJER..... 325
ON THE SEMI-ACTIVE CONTROL OF CARRYING STRUCTURES UNDER A MOVING LOAD

47. Iwona PODGÓRSKA-BRZDĘKIEWICZ 331
INSTABILITY AND FREE VIBRATIONS OF A COLUMN WITH IMPERFECTION SUBJECTED TO LOAD BY THE FORCE DIRECTED TOWARDS THE POSITIVE POLE

48. Rafał RUMIN, Jacek CIEŚLIK..... 337
SYSTEM FOR AUTOMATIC ROTOR BALANCING USING A CONTINUOUS CHANGE OF THE CORRECTION MASS DISTRIBUTION

49. Rafal RUSINEK, Jerzy WARMINSKI, Marcin SZYMANSKI, Marek ZADROZNIAK..... 343
ANALYSIS OF HUMAN EAR OSSICLES VIBRATIONS

50. Bogdan SAPIŃSKI, Jacek SNAMINA, Mateusz ROMASZKO 349
IDENTIFICATION OF MODEL PARAMETERS OF A SANDWICH BEAM INCORPORATING AGNETORHEOLOGICAL FLUID

51. Wojciech SAWCZUK, Franciszek TOMASZEWSKI 355
ASSESSING THE WEAR OF FRICTION PADS IN DISC BRAKING SYSTEM OF RAIL VEHICLE BY USING SELECTED AMPLITUDE CHARACTERISTICS OF VIBRATION SIGNAL

52. Jacek SNAMINA, Andrzej PODSIADŁO, Piotr HABEL 361
ACTIVE VIBROISOLATION SYSTEM WITH MAGNETIC SPRINGS

53. Wojciech SOCHACKI 367
DYNAMIC STABILITY OF BEAMS WITH HARMONIC OSCILLATOR

54. Asja SOKOLOVA, Feliks BALITSKIY 373
LOCALIZATION OF INCREASED VIBROREACTIVITY SOURCES BASED ON S-DISCRIMINANT ANALYSIS AND EXEMPLIFIED ON GAS TURBINE UNIT

55. Roman STAROSTA, Grażyna SYPNIEWSKA-KAMIŃSKA, Jan AWREJCEWICZ 379
MULTIPLE SCALE ANALYSIS OF A NONLINEAR KINEMATICALLY DRIVEN SYSTEM WITH PENDULUM

56. Stanisław STRZELECKI, Zygmunt TOWAREK 385
STABILITY OF ROTOR OPERATING IN CYLINDRICAL 3-POCKET JOURNAL BEARINGS

57. Ryszard SYGULSKI 393
LIQUID SLOSHING IN BAFFLED TANKS

58. Janusz SZMIDLA 399
FREE VIBRATIONS OF A COLUMN WITH AN OPTIMUM SHAPE WITH REGARD TO THE VALUE OF THE CRITICAL LOAD LOADED BY A FOLLOWER FORCE DIRECTED TOWARDS THE POSITIVE POLE

59. Janusz SZMIDLA 405
FREE VIBRATIONS OF A Γ TYPE PLANAR FRAME LOADED BY A FOLLOWER FORCE DIRECTED TOWARDS THE POSITIVE POLE

60. Tomasz SZOLC, Andrzej POCHANKE 411
TRANSIENT AND STEADY-STATE COUPLED ELECTROMECHANICAL VIBRATION ANALYSIS OF THE MICRO-DRIVE SYSTEM

61. Lech TOMSKI, Iwona PODGÓRSKA-BRZDĘKIEWICZ..... 417
INSTABILITY AND FREE VIBRATIONS OF A GEOMETRICALLY NON-LINEAR CANTILEVER COLUMN WITH IMPERFECTIONS SUBJECTED TO EULER'S LOAD

62. Lech TOMSKI, Janusz SZMIDLA, Sebastian UZNY 423
DIVERGENCE AND FLUTTER INSTABILITY OF A COLUMN SUBJECTED TO REUT'S GENERALIZED LOAD WITH REGARD TO ROTATIONAL ELASTICITY

63. Lech TOMSKI, Sebastian UZNY..... 429
CHOSEN SLENDER SYSTEMS IN ASPECT OF POSSIBILITY OF SPECIFIC LOAD REALIZATION

64. Anita USCILOWSKA, Agnieszka FRASKA 435
AN INVESTIGATION OF FUNCTIONALLY GRADED MATERIAL PARAMETERS EFFECTS ON FREE TORSIONAL VIBRATIONS OF A BAR USING MESHFREE METHODS

65. Sebastian UZNY 441
LOCAL AND GLOBAL INSTABILITY AND VIBRATIONS OF A GEOMETRICALLY NONLINEAR CANTILEVER COLUMN WITH REGARD TO THE FINITE ELASTICITY OF ELEMENT CONNECTING INDIVIDUAL RODS

66. Tomasz WALCZAK, Bogdan MARUSZEWSKI, Roman JANKOWSKI, Marta CHUDZICKA-ADAMCZAK 447
APPLICATION OF FUNDAMENTAL SOLUTION METHOD IN CERVICAL SPINE BIOMECHANICS

67. Tomasz WALCZAK, Bogdan MARUSZEWSKI, Roman JANKOWSKI, Marta CHUDZICKA-ADAMCZAK 453
MODEL OF THE CERVICAL SEGMENT OF THE SPINE BASED ON THE THEORY OF STRONGLY CURVED BEAMS

68. Iwona WANAT, Marek IWANIEC 459
SIMULATION OF CONTROLLED DRUG RELEASE FROM BIOMATERIAL DELIVERY

69. Jacek WDOWICKI 465
CONTINUOUS CONNECTION METHOD IN DYNAMIC ANALYSIS OF COMPOSITE TALL BUILDING STRUCTURES

70. Małgorzata WOJSZNIS, Marian Witalis DOBRY 471
IDENTIFICATION RESEARCH ON A DEMOLITION HAMMER

ABSTRACT ONLY

1. V.I. ALSHITS, V.N. LYUBIMOV, A. RADOWICZ 477
ABNORMAL DISPERSION OF ACOUSTIC EIGENWAVES IN ANISOTROPIC PLATES

2. V.I. ALSHITS, V.N. LYUBIMOV, A. RADOWICZ..... 478
INTERFACIAL ELASTIC WAVES AT TWIST BOUNDARIES IN TRANSVERSELY ISOTROPIC MEDIA