

JEMNÁ MECHANIKA A OPTIKA

VĚDECKO-TECHNICKÝ ČASOPIS
ROČNÍK 52 7 - 8/2007

OBSAH

<i>Rentgenová optika tečného dopadu</i> (R. Hudec).....	203
<i>Aplikace nelineárních optimalizačních metod při vyhodnocování módových spekter planárních vlnovodů</i> (O. Bárta, J. Pištora, J. Vlček, F. Staněk, T. Kreml)	211
<i>System pre určenie okamžitého technického stavu rotujících strojov počas plynulého priebehu dynamického namáhania</i> (R. Krehel)	218
<i>Pružné klouby ve výpočtu i praxi</i> (J. Maršík).....	220
<i>Základné fakty o veľtrhu v Nitre</i> (P. Horňák).....	223
<i>Laser – začiatok novej epochy</i> (D. Senderáková)	224
<i>Fórum normalizátorov na Slovensku</i> (P. Horňák)	228
<i>Holografia – skutočne 3D obraz</i> (D. Senderáková).....	229
<i>Optický tok a nová metoda jeho výpočtu pomocí EMF</i> (J. Kokeš)	232
<i>Observatoř Pierra Augera začala sdílet data o kosmickém záření s veřejností a studenty</i>	236
<i>Doplněk o české účasti v projektu Pierra Augera</i>	236
<i>EQUOTIP – Měření tvrdosti dynamickou metodou</i> (Č. Nenáhl).....	237
<i>75. narozeniny docenta Jana Eigla</i> (A. Mikš)	238
<i>Metódy na meranie fotometrických veličín</i> (P. Horňák)	238
<i>Nové přístupy v technologickém vzdělávání – Vývoj a integrace evropských modulů v technologickém vzdělávání</i> (K. Nevřalová).....	240

Obsah časopisu Jemná mechanika a optika je uveden na internetu: <http://jmo.fzu.cz>

Informace o předplatném podá, objednávky přijímá, objednávky do zahraničí vyřizuje: SLO UP a FZÚ AV ČR, Tř. 17. listopadu 50, 772 07 Olomouc, tel.: 585 223 936, fax: 585 631 531.

Cena čísla 80 Kč včetně DPH

FINE MECHANICS AND OPTICS

SCIENTIFIC-TECHNICAL JOURNAL
VOLUME 52 7 - 8/2007

CONTENTS

<i>Tangential X-ray imaging</i> (R. Hudec).....	203
<i>Application of nonlinear optimization methods for interpretation of mode spectra in planar waveguides</i> (O. Bárta, J. Pištora, J. Vlček, F. Staněk, T. Kreml)	211
<i>System for determining actual technical condition of spinning machinery continuous process dynamic stress</i> (R. Krehel).....	218
<i>Elastic hinges in design and practice</i> (J. Maršík).....	220
<i>Basic facts about trade-fair in Nitra</i> (P. Horňák).....	223
<i>Laser – a new era beginning</i> (D. Senderáková)	224
<i>Standardisers' panel in Slovakia</i> (P. Horňák).....	228
<i>Holography – 3D picture, indeed</i> (D. Senderáková).....	229
<i>Optical flow and its new calculation using EMF</i> (J. Kokeš)....	232
<i>Pierre Auger Observatory has already started to share cosmic radiation data with public and students</i>	236
<i>Complementary Czech participation in Pierre Auger project</i>	236
<i>EQUOTIP – Hardness measurement by dynamical method</i> (Č. Nenáhl).....	237
<i>75th birthday of associate professor Jan Eigl</i> (A. Mikš).....	238
<i>Measurement methods for photometric quantities</i> (P. Horňák).....	238
<i>New Approach in Technology Education - Development and Integration of European Modules in Technology Education</i> (K. Nevřalová).....	240

You can also find the contents of the Journal on internet: <http://jmo.fzu.cz>

Information on subscription rate and on ordering gives the SLO UP a FZÚ AV ČR, Tř. 17. listopadu 50, 772 07 Olomouc, tel.: 585 223 936, fax: 585 631 531.

Price for single copy: 80 Kč incl. VAT

CONTENTS

Tangential X-ray imaging (R. Hudec).....	203
Application of nonlinear optimization methods for interpretation of mode spectra in planar waveguides (O. Bárta, J. Pištora, J. Vlček, F. Staněk, T. Kreml)	211
The paper is focused into the area of experimental research of planar waveguide structures. Dark mode spectroscopy technique, which is based on excitation of guided modes, is presented here in detail. The physical aspects of the method are shortly described with a special focus on coupling prism theory. The main attention of our contribution is devoted to the application of new mathematical optimization methods related to guided modes and the determination of refractive indices and thicknesses of thin films. Keywords: planar waveguide structure, prism coupling, dark mode spectroscopy, non-linear optimization	
System for determining actual technical condition of spinning machinery continuous process dynamic stress (R. Krehel)	218
Integral part of this process is mainly evaluation of vibrations degree and behavior during actual service. Vibrodiagnostics use vibrations as a diagnostic parameter which are caused by dynamic stress to machine. This very diagnostic parameter gives information for determining actual technical condition of spinning machinery. Primary objective of machinery vibration monitoring is to supply information about machinery operating and technical condition in order to ensure strategic maintenance planning and managing.	
Elastic hinges in design and practice (J. Maršík)	220
Designers have to solve every day simple problem, how to achieve relative motion of two components. Standard solution is based upon application of friction or rolling. Final mechanism contains many components, needs maintenance and brings risk of hysteresis, which is critical especially in precision mechanics applications. Many of these obstacles can be overcome if using elastics deformation. Such application is called elastic hinge. This article shows simple ways how to calculate elastic hinges and gives few hints in their design process.	
Basic facts about trade-fair in Nitra (P. Horňák)	223
Laser – a new era beginning (D. Senderáková)	224
Physical research, which in 1960 enabled the first laser to be constructed and to generate the first laser beam, put light possessing unique feature into the human hands. It was coherent light, which opened entirely new possibilities, even never contemplated before for both, the research and everyday life. The paper is to explain in a simply way what is the unique of laser light based on and how it can be obtained. Besides, a short overview of practical usage of lasers today is mentioned. There is such a variability of laser utilization that the 21st century is sometimes said to be the photon century, like the the 20th one used to be called the electron century. Key words: laser, light emission, light absorption, coherence, optical technologies	
Standardisers' panel in Slovakia (P. Horňák).....	228
Holography – 3D picture, indeed (D. Senderáková).....	229
Invention of a laser brought entirely new kind of light. People could have obtained such a light of very low intensity before in a very labour some way. It is coherent light. People need it to perform interference and diffraction of light, which had already been of practical use before laser was at hand. Laser made practical usage of these phenomena much more easy. Simultaneously, a brand-new kind of optical recording was born – holography. It is to explain recording and reconstruction of holograms in a simply way and show the most important properties of them.	
Optical flow and its new calculation using EMF (J. Kokeš)	232
Paper describes a new method of optical flow computation. This method is based on empiric modal functions developed in HHT. Main advantage of new approach is a substantially lower computational complexity compared to classic Lucas-Kanade algorithm, as well as lower sensitivity to noise and to distortion. Compared to similar older approach based on windowed Fourier transform, presented method gains better spatial resolution.	
Pierre Auger Observatory has already started to share cosmic radiation data with public and students	236
Complementary Czech participation in Pierre Auger project	236
EQUOTIP – Hardness measurement by dynamical method (Č. Nenáhlo).....	237
75th birthday of associate professor Jan Eigl (A. Mikš)	238
Measurement methods for photometric quantities (P. Horňák)	238
New Approach in Technology Education - Development and Integration of European Modules in Technology Education (K. Nevřalová)	240