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OBSAH

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The development of new technologies for fabrication of thin films, quantum replication and quantum information schemes in the section Optics, Institute of Physics of Academy of Sciences of the Czech Republic (A. Dejneka, M. Hrabovský, Z. Hubička, M. Jelínek) 63

The staff of the section Optics (Institute of Physics of Academy of Sciences of the Czech Republic) is first of all specialised in the research in classical and quantum aspects of light propagation, optical materials and practical structures. This research is mainly supported drawing the research objective AVOZ10100522 funds, however the participation of national and international projects is substantial. Recently, the considerable part of results consists in research and implementation of new plasma and optical technologies for deposition and modification of thin-film systems and nanostructures. Their remarkable achievements can be primarily found in low-temperature plasma deposition and pulsed laser ablation. Other section research activities of sustained interest are devoted to the tasks of quantum and nonlinear optics, especially to quantum replication and quantum information schemes.

Methods of phase analysis of optical wave field based on measurement of phase gradient (P. Novák, J. Novák)..... 67

An overview of methods evaluating the wave field phase based on the measurement of phase gradient and/or wave-front gradient is presented. Both classical and modern methods evaluating the phase are mentioned and applications from industrial metrology to adaptive astronomical systems are indicated.

Twentieth anniversary of prof. RNDr. Bedřich Havelka, DrSc.'s decease 71

Measurements of effective emissivity of calibration target (P. Nemeček, I. Christov)..... 72

The value of emissivity is the basic correction factor in a measurements models all measures for noncontact temperature measurements. This factor is explicitly applied by measurements and implicitly by primary calibration when is the part of the calibration constant. Increasing demand on precision of temperature measurements stimulates also necessity precise and accurate measurements of the emissivity value.

Application of digital camera for determination of surface tension (J. Sedláček, J. Zeman)..... 77

The paper describes the new method of the surface tension measurement by usage of a digital camera.

Heating value study of cotton-plant organs (I. Gravalos, D. Kateris, P. Xyradakis, Z. Tsiropoulos) 79

Waste biomass stays on the field after the cotton harvest. It can be used for thermal or electric energy production. Organs of cotton plants were burned in a bomb calorimeter and the heating value was measured. Our results are presented.

Localization method of acoustic emission based on Akaike' information criterion (P. Sedlák, M. Enoki)..... 82

Acoustic emission (AE) offers a great potential due to its ability of quantitative evaluation such as a source location and a source characterization. Determination of an arrival time is a fundamental problem, which influences precise localization of AE events. Manual picks are time consuming and sometimes subjective, especially in the case of large volumes of digital data. Various techniques have been presented in the literature and are routinely used in practice such as a passing the threshold level, analysis of the LTA/STA (Long Term Average / Short Term Average) or high order statistics.

The paper represents an approach based on Akaike information criterion. The comparison of this approach and the methods described above was carried out on a model situation, when acoustic emission events were generated by two artificial sources AE.

Keywords: acoustic emission, localization, arrival time determination

Surface magnetic properties of as-quenched and annealed FeNbB ribbons (O. Životský, L. Klimša, K. Hrabovská, A. Hendrych, K. Postava)..... 84

Paper is devoted to magneto-optical (MO) methods, which are frequently used for investigation of surface magnetic properties of magnetic nanostructures. We describe two MO set-ups that are recently built in scientific laboratories of Institute of Physics VŠB-TU Ostrava. Differential MO method based on the surface hysteresis loop measurements enables to obtain separate components of magnetization vector M and to study the anisotropy of magnetic systems. Basic element of the second set-up is the MO Kerr microscope, which serves for the magnetic domains and domain wall observations. Both mentioned methods in combination with other magnetic measurements (X-ray diffraction, conversion electron Mössbauer spectroscopy) are used to investigate soft magnetic properties of as-quenched and annealed FeNbB ribbons.

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