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Discharge pumped Pr: YalO3 laser generating visible radiation (M. Fibrich, H. Jelínková, J. Šulc, A. Novotný, K. Nejezchleb, V. Škoda)..... 132

A successful generation of Pr: YalO3 (Pr:YAP) laser visible radiation 747 nm and 662 nm was achieved under room temperature. Discharge-pumped Pr:YAP laser was working in pulse and free-generation regimes. A steady laser action occurs when using a special plane glass colour UV filter placed inside laser cavity. Maximal output pulse energy 102 mJ was generated at the wavelength 747 nm with corresponding pulse duration 92 μ s. Inserting the diaphragm inside the resonance cavity it was possible to obtain a beam quality described by the parameter $M^2 \sim 1.2$. In the case of 662nm laser emission the corresponding parameters are 6.1 mJ, 47.5 μ s a $M^2 \sim 1,5$ (without resonator diaphragm). The shape and width of spectral line are stabilised in both cases for various pumping power.

Keywords: Pr: YalO3 laser, discharge-pumping, colour UV filter

Third SPIE Europe Symposium on „Optics and Optoelectronics“ (P. Tománek)..... 137

Prague Congress Centre hosted recently more than 460 scientists from 47 countries, which have taken part in third SPIE Europe Symposium on Optics and Optoelectronics (20-23 April 2009). They answered to the invitation, and the most important optical event ever organised in the Czech Republic has been born. The excellent and exciting plenary talks on Hot topics in Optics were followed by successful ten conferences on Metamaterials, Nonlinear optics and Applications, Photon Counting applications, Quantum optics and Quantum Cryptography, Adaptive optics for Laser Systems and Other Applications, Optical Sensors, Damage to VUV, EUV and X-Ray Optics, Photonic Crystal Fibers, Holography. The importance of the Symposium was enhanced by presence of SPIE President Prof. Maria Yzuel.

3D holographic generation: an overview

(M. Škereň, P. Fiala) 139

The article is an overview of basic findings used in classical holography recording. It summarises the holography methods for generating 3D pictures and various approaches evolved during the last 50 years. It also can serve as an introduction to more specific presentations dealing with actually employed design and construction hologram techniques.

Hybrid aplanatic optical systems (J. Hopp, P. Fiala)..... 144

A method of optical design of hybrid optical systems by utilization the

aplanatic condition is introduced here. The aplanatic condition was taken as a main optimizing criterion for the design of phase functions of diffractive optical elements during the optimization procedure.

The phase function of the diffractive element can be arbitrary. We don't restrict ourselves to diffractive optical elements with a spherical phase function. Several hybrid optical systems, in particular hybrid doublets and hybrid triplets, consisting of one diffractive element and one or two refractive lenses, were designed and analyzed by this method.

Keywords – optical design, diffractive optical element, hybrid optical system, aplanatism.

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The determination of power characteristic of the atypical blade stirrer during mixing of model suspension

(L. Chládek, M. Příklad, J. Zeman)..... 154

The way of determination of the power characteristic of blade stirrer during mixing of water and model suspension in pilot plant is described. The model suspension (concentration 10% and 17% (w/w)) was prepared using crashed malt with a defined particle sizes. The experimental tests with different volumes of water and model suspensions were carried out, power characteristics of the atypical blade stirrer calculated, obtained results showed quite different course of power characteristic of blade stirrer compared with a turbo-stirrer.

Keywords: power characteristic, blade stirrer, suspension, malt crash, mash

New generation instruments for laser lithography 158

Laser lithography is a crucial technology for a number of today production activities. Typical examples are micro and nanoelectronics, micro and nanofluidics, photonics and biotechnology. Current procedures for creation 2D structures (or 2.5D ones considering the layer thickness) in sensitive to light materials are at the edge of their limits both in the research and industry. But a progress in lithography is also not yet abandoned, using the new procedure it is for the first time possible to build up the very complex 3D micro and nanostructures in sensitive to light materials.