



17th International Conference
“Laser Optics 2016”
Technical Program

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LASER RADIATION

Saint Petersburg, Russia
June 27 - July 1, 2016

TECHNICAL SESSION

R9. OPTICAL NANOMATERIALS

Location: Stenberg Room, floor 3, 15:00 – 16:30

Optical Nanomaterials III

Session Chair: Ray LaPierre,

Centre for Emerging Device Technologies, McMaster Univ., Canada

TuR9-11 15:00-15:15 High-sensitivity side-coupled symmetric-shaft-shape photonic crystal sensor arrays

Zh. Fu, J. Zhou, L. Huang, F. Sun, H. Tian; Beijing Univ. of Posts and Telecommunications, China

High-sensitive symmetric-shaft-shape photonic crystal sensor arrays (SSPhCSAs) consisting of four cavities side-coupled to a W1 waveguide are designed. The sensitivities of the four sensor units are from 178 to 398 nm/RIU.

TuR9-12 15:15-15:30 Laser formation of the metal-carbon islands thin films for optical application

A. Kucherik¹, A. Antipov¹, S. Arakelian¹, S. Kutrovskaya¹, A. Osipov¹, T. Vartanyan², A. Povolotckaia³, A. Povolotskiy³, A. Manshina³; 1 - Stoletov Vladimir State Univ., 2 - ITMO Univ., 3 - St. Petersburg State Univ., Russia

In this work a method for the laser formation of C-Au-Ag clusters and complexes on the surface of an optically transparent media is discussed.

TuR9-13 15:30-15:45 Saturation parameters studies of carbon nanotube-based thin-film saturable absorbers for erbium fiber laser mode-locking

A.A. Krylov¹, S.G. Sazonkin², N.R. Arutyunyan^{3,4}, V.V. Grebenyukov³, A.S. Pozharov³, D.A. Dvoretzkiy², A.B. Pnev², V.E. Karasik², E.D. Obraztsova^{3,4}, E.M. Dianov¹; 1 - Fiber Optics Research Center RAS, 2 - Bauman Moscow State Technical Univ., 3 - Prokhorov General Physics Inst. RAS, 4 - National Research Nuclear Univ. MEPhI, Russia

We have experimentally studied saturation behavior of Single-Walled Carbon Nanotube-based saturable absorbers at different temperatures and SWCNT concentrations in the carboxymethylcellulose polymer matrix and related it to the mode-locked erbium-doped fiber laser performance.

TuR9-14 15:45-16:00 Ferrofluid as promising magnetically controlled material for optofluidics and microstructured fiber-based sensing

A.V. Prokofiev^{1,2}, A.V. Varlamov^{1,2}, P.M. Agruzov¹, I.V. Pleshakov^{1,2}, E.E. Bibik³, S.I. Stepanov⁴, A.V. Shamray^{1,2}; 1 - Peter the Great St.Petersburg Polytechnic Univ., Russia, 2 - Ioffe Inst., Russia, 3 - St. Petersburg State Inst. of Technology (Technical Univ.), Russia, 4 - CICESE, Mexico

Studies of magneto-optic properties of Fe₃O₄ ferrofluid (colloidal solution of nanosized particles) in a pulsed and AC magnetic field are reported. It is shown that a microstructured optical fiber with cladding holes filled with ferrofluid is sensitive to the external magnetic field vector and that operating speed of magnetically controlled optofluidic devices can be increased by using a transverse biasing.

TuR9-15 16:00-16:15 Novel hybrid materials based on various oxyquinoline organic phosphorus complexes and oxyfluoride glass

M.O. Anurova, C.V. Ermolaeva, O.B. Petrova, A.V. Khomyakov, A.A. Akkuzina, R.I. Avetisov, I.Ch. Avetisov; Mendeleev Univ. of Chemical Technology, Russia

Novel luminescent organic-inorganic hybrid materials were synthesized by high temperature reaction between metalorganic phosphors and glass. In the present research we used a lead fluoroborate glass as an inorganic matrix and various luminescent oxyquinoline complexes as organic active agent.

TuR9-16 16:15-16:30 Laser correlation spectroscopy and nonlinear magneto-optic response of structures formed by nanoparticles in magnetic fluid

E.K. Nepomniashchaia¹, A.V. Prokofiev^{1,2}, E.T. Aksenov¹, I.V. Pleshakov^{1,2}, E.E. Bibik³, E.N. Velichko¹, Yu.I. Kuzmin^{1,2}; 1 - Peter the Great Saint Petersburg Polytechnic Univ., 2 - Ioffe Inst., 3 - St. Petersburg State Inst. of Technology, Russia

Investigations of the agglomeration process in liquid nanostructured materials (magnetic fluids) and its effect on their optical properties are presented.

R10. FREE ELECTRON LASERS

Location: Rihter Room, floor 3, 09:00 – 11:00

Hard X-ray FELs

Session Chair: Wilfried Wurth,
DESY/ Univ. Hamburg, Germany

TuR10-01 Invited 09:30-10:00 European XFEL: status and research instrumentation

S.L. Molodtsov; European XFEL GmbH, Technische Univ. Bergakademie Freiberg, Germany, ITMO Univ., Russia

The European XFEL is a new international research installation that is currently under construction in Germany. The facility will generate new knowledge in almost all the technical and scientific disciplines that are shaping our daily life. The status and research instruments are described here.

TuR10-02 Invited 10:00-10:30 Ultrafast pump-probe laser for the European X-ray free-electron laser facility

M. J. Lederer, M. Pergament, M. Kellert, K. Kruse, J. Wang, G. Palmer, L. Wissmann, U. Wegner, M. Emons; European X-Ray Free-Electron Laser-Facility GmbH, Germany

We present a versatile and flexible ultrafast optical laser setup, developed for future experiments at the European XFEL. Like the XFEL, the laser operates in burst-mode, emitting milli-Joule class few-cycle pulses at MHz repetition rates. At its core is an optical parametric amplifier optimized for 800nm emission. We present the design, capabilities, scope of operation and installation schedule.

TuR10-03 Invited 10:30-11:00 Measurements on 3D spatial distribution, spectral and coherent properties of focused XFEL beam

S.A. Pikuz¹, T.A. Pikuz^{1,2}, A.Ya. Faenov^{1,2}, A.N. Mitrofanov¹, T. Matsuoka³, S. Matsuyama³, K. Yamauchi³, N. Ozaki³, Y. Inubushi⁴, M. Yabashi^{4,5}, K. Tono^{4,5}, Y. Sato⁶, H. Yumoto⁴, H. Ohashi^{4,5}, A.N. Grum-Grzhimailo⁶, M. Nishikino⁷, T. Kawachi⁷, T. Ishikawa^{4,5}, R. Kodama²; 1 - Joint Inst. for High Temperatures RAS, Russia, 2 - Osaka Univ., Japan, 3 - Osaka Univ., Japan, 4 - JASRI/SPring-8, Japan, 5 - RIKEN Harima Inst., Japan, 6 - Lomonosov Moscow State Univ., Russia, 7 - Quantum Beam Science Center JAEA, Japan

Versatile and convenient method to measure in situ the parameters of intense X-ray beams is developed applying photoluminescence LiF crystal detector. The capabilities of the method are demonstrated in the experiments at BL3 SACLA-SPring8 beam line showing uniquely high sensitivity, dynamic range, and submicron spatial resolution of the detector. It allows to measure the intensity distribution of the beam inside the focal spot and at far field in the same single laser shot, that makes the method attractive for optimization of focusing systems developed at FEL, synchrotron and plasma-based SXL facilities. The approach to study coherent and spectral properties of X-ray beams based on the analysis of diffraction patterns recorded on LiF films is introduced.

- Coffee Break -