

WEp: Wednesday Poster Session

Time: Wednesday 13:30–14:30

Location: Corridor

WEp.1 Wed 13:30

Modulational instability superimposes to mode-locking regime at high pump power in a highly normal Er-doped fiber laser — ●AMÉLIE CABASSE¹, GILLES MARTEL¹, and JEAN-LOUIS OUDAR² — ¹CORIA UMR 6614, Université de Rouen, Avenue de l'université BP 12, 76801 Saint Etienne du Rouvray, France — ²LPN-CNRS, UPR 20, Route de Nozay, 91460 Marcoussis

Adding dispersion shifted fiber inside a mode-locked fiber laser cavity, autocorrelation traces show a pump-power dependent duration with a triangular shape and optical spectra present noticeable side lobes.

These changes will be discussed in the frame of cavity-losses-dependent modulational instability effects superimposed to mode-locking regime

WEp.2 Wed 13:30

Mirrorless laser action in micromachined buried waveguides made in Nd:YAG ceramic crystals — ●GUSTAVO TORCHIA^{1,2}, AIRAN RODENAS³, DANIEL JAQUE³, EUGENIO CANTELAR³, ANTONIO BENAYAS³, and LUIS ROSO² — ¹Centro de Investigaciones Opticas CIC Conicet La Plata, Argentina — ²Grupo de Optica Universidad de Salamanca, Salamanca, Spain — ³Departamento de Fisica de Materiales, Universidad Autonoma de Madrid, Madrid, Spain

This work deals with high efficiency laser gain obtained for buried waveguide made in Nd:YAG ceramic crystals by means of fs laser writing. Mirrorless laser action was achieved by using as output coupler Fresnel's reflection in the interface crystal-air. Slope efficiency of about 60% has been determined in this work.

WEp.3 Wed 13:30

Reflective volume (R=80%) gratings in Ti:sapphire waveguides fabricated by femtosecond UV-laser pulses — ●CHRISTOS GRIVAS and ROBERT EASON — Optoelectronics Research Centre University of Southampton, Southampton SO17 1BJ, United Kingdom

Volume Bragg gratings (R=80%) were written in Ti:sapphire pulsed-laser-deposited waveguides by exposure to 266-nm-femtosecond laser irradiation through phase masks. Refractive index modulations up to 1×10^{-2} were observed, which were completely reversible at $\sim 100^\circ\text{C}$. It is believed the gratings' formation mechanism involves Ti^{3+} - Ti^{4+} charge transfer processes and/or transient localized structural re-arrangements.

WEp.4 Wed 13:30

Demonstration of guided light in monoclinic potassium double tungstates layers grown on substrates of the same family. — WESTERN BOLAÑOS, JOAN JOSEP CARVAJAL, ●XAVIER MATEOS, MAGDALENA AGUILO, and FRANCESC DIAZ — Física i Cristallografia de Materials (FiCMA), University Rovira i Virgili (URV), c/Marcellí Domingo, s/n, E-43007, Tarragona, Spain

Guiding of light has been demonstrated on highly doped epitaxial $\text{Yb:KLu}(\text{WO}_4)_2$ layers grown on $\text{KLu}(\text{WO}_4)_2$

substrates. Two guided modes for propagations along Ng and Nm have been recorded in these epitaxies. We also optimized the chemical composition of the $\text{KY1-x-yGdxLuy}(\text{WO}_4)_2$ system to develop passive planar waveguides and integrated photonic devices.

WEp.5 Wed 13:30

Optical Signal Copying by Cross-Phase Modulation with Triangular Pulses — ●ANTON I. LATKIN^{1,2}, SONIA BOSCOLO², RANJEET BHAMBER², and SERGEI K. TURITSYN² — ¹Novosibirsk State University, Novosibirsk, 630090, Russia — ²Photonics Research Group, School of Engineering and Applied Science, Aston University, Birmingham B4 7ET, United Kingdom

We propose a new technique of copying optical pulses in both time and frequency domains based on a combination of cross-phase modulation induced by a triangular pump pulse in a highly nonlinear fibre and subsequent propagation in a dispersive medium.

WEp.6 Wed 13:30

Generation of 75 fs pulses directly from passively mode-locked all-fiber laser — ●MICHAL NIKODEM, ADAM WATRAS, and KRZYSZTOF ABRAMSKI — Wrocław University of Technology, Wrocław, Poland.

Growing interest in mode-locked fiber lasers can be observed. The mode-locking with the nonlinear polarization rotation is used when sub-100-fs pulses are desirable. We demonstrate EDF laser with 75 fs pulse duration, the repetition frequency 4.6 MHz and the single pulse energy 5.6 nJ (the average output power 26 mW).

WEp.7 Wed 13:30

Raman Scattering Intensity and Bandwidth Enhancement Effect of MoO3 in Tellurite Fiber Glasses — RAJAN JOSE and ●YASUTAKE OHISHI — Toyota Technological Institute, Nagoya, Japan

We clarify that MoO3 enhanced the Raman gain coefficient and bandwidth simultaneously compared to WO6 and NbO6 octahedra and PO4 tetrahedra in tellurite glasses and MoO6 octahedra structure is simulated. It is shown that a new TeBiNbMo tellurite glass can realize gain flattened (S+C+L) ultra-broadband Raman amplifier.

WEp.8 Wed 13:30

Effect of neodymium clustering on the laser emission at 930nm in a W-type waveguide double-clad fiber — ●CÉLIA BARTOLACCI¹, MATHIEU LAROCHE¹, HERVÉ GILLES¹, SYLVAIN GIRARD¹, THIERRY ROBIN², and BENOIT CADIER² — ¹Centre de recherche sur les Ions, les Matériaux et la Photonique (CIMAP), UMR 6252 CEA-CNRS-ENSICAEN, Université de Caen, 6 Blvd Maréchal Juin 14050 CAEN Cedex, France — ²iXFiber, Rue Paul Sabatier, 22300 Lannion, France

We report on the investigation of Nd^{3+} clusters in W-type highly doped double-clad fibers and their effect on 930nm laser emission. Experimental characterisations and results from finite-difference numerical modelling show up to 50%

of neodymium ions in clusters and both confirm a strong decrease of laser emission at 930nm.

WEp.9 Wed 13:30

Structure of Absorption and Luminescence Bands in Aluminosilicate Optical Fibers Doped with Bismuth

— ●LENAR BULATOV¹, VALERY MASHINSKY², VLADISLAV DVOYRIN², EVGUENI KUSTOV², and EVGUENI DIANOV² — ¹M.V. Lomonosov Moscow State University, Faculty of physics, Vorobievsky Gori, 119922 Moscow, Russia — ²Fiber Optics Research Center, Russian Academy of Sciences, 38 Vavilov Street, 119333 Moscow, Russia

Detailed structure of broadband absorption and luminescence in MCVD aluminosilicate optical fibers doped with bismuth was revealed by their measurements in the temperature range of 77 to 1000K. Different temperature behavior of absorption and luminescence bands allows to suppose that there exist two types of bismuth active centers.

WEp.10 Wed 13:30

Yb-doped fluorite lasers under 100W diode pumping and in situ measurement of their thermal constants

— ●JUSTINE BOUDEILE¹, JULIEN DIDIERJEAN¹, PATRICE CAMY², JEAN-LOUIS DOULAN², ABOU BENAYAD², VIVIEN MÉNARD², RICHARD MONCORGÉ², FRANÇOIS BALEMBOIS¹, FRÉDÉRIC DRUON¹, and PATRICK GEORGES¹ — ¹Laboratoire Charles Fabry de l'Institut d'Optique, Palaiseau, France — ²Centre de Recherche sur les Ions, Matériaux et la Photonique, Caen, France

We investigate, for the first time, the thermal properties of Yb:CaF₂ and Yb:SrF₂ crystals under high power pumping, with or without laser operation. We evaluate the thermal conductivity and thermo-optic coefficients. Our measured thermal lenses lead to greater thermo-optic coefficients than expected from the parameters found in previous works.

WEp.11 Wed 13:30

Coherent manipulation and high resolution spectroscopy of Pr³⁺ ions in La₂W₃O₁₂

— ●BEAUDOUX FLORIAN¹, GUILLOT-NOËL OLIVIER¹, RIPPE LARS¹, VINCENT JULIEN¹, LEJAY JULIEN¹, AMARI ATIA², WALTHER ANDREAS², KRÖLL STEFAN², and GOLDNER PHILIPPE¹ — ¹Laboratoire de Chimie de la Matière Condensée CNRS UMR 7574, 11 rue Pierre et Marie Curie, 75321 Paris Cedex 05 (France) — ²Department of Physics, Lund Institute of Technology, P. O. Box 118, S22100 Lund (Sweden)

We report the high resolution optical spectroscopy of the 3H₄-1D₂ transition of Pr³⁺ ions in La₂W₃O₁₂ single crystal. The hyperfine coherent properties of this transition are also determined using a non-conventional hole-burning experiment. Finally, using these characterisations, an efficient electromagnetically induced transparency has been realized.

WEp.12 Wed 13:30

Near infrared luminescence of RbPb₂Cl₅:Bi crystals

— ●ANDREY OKHRIMCHUK¹, LEONID BUTVINA¹, EUGENY DIANOV¹, NINEL LICHKOVA², VLADIMIR ZAGORODNEV², and KIRILL BOLDYREV³ — ¹Fiber Optics Research Center, RAS, 38 Vavilov Str., Moscow 119333, Russia — ²Institute of Microelectronics Technology, RAS, Chernogolovka, Moscow region 142432, Russia — ³Institute

of Spectroscopy RAS, Troitsk, Moscow region 142190, Russia

Wideband near infrared luminescence centered at 1080 nm was found in the RbPb₂Cl₅:Bi crystal. Absorption, luminescence and excitation of luminescence spectra were investigated at room and cryogenic temperatures. The luminescence was attributed to the 3P₁*3P₀ transition in Bi⁺ ion.

WEp.13 Wed 13:30

Pulse-to-pulse coherent beat note from a Q-switched two-frequency laser

— ●MARC BRUNEL and MARC VALLET — Université de Rennes 1-CNRS, Rennes, France

We demonstrate that the coherence time of the pulsed beat note emitted by a dual-polarization passively Q-switched laser is extended from 40 ns (1 pulse) to more than 1 s (3,000 pulses), when using a frequency-shifted self-seeding feedback method.

WEp.14 Wed 13:30

Mode-locked OP-VECSEL at 1550nm with line width <10 kHz

— ●AGHIAD KHADOUR¹, SOPHIE BOUCHOULE¹, GUY AUBIN¹, JEAN-PHILIPPE TOURENC¹, AUDREY MIARD¹, JEAN-CHRISTOPHE HARMAND¹, JEAN DECOBERT², and JEAN-LOUIS OUDAR¹ — ¹Laboratoire des photoniques et de Nanostructures, Route de Nozay, 91460 Marcoussis, France — ²ALCATEL III-V Lab, Route de Nozay, 91460 Marcoussis, France

We present a 1550 nm mode-locked VECSEL at 2GHz repetition rate and a pulse width less than 20 picoseconds, with a narrow line width less than 10KHz, primary measurements indicates the possibility to obtain an ultra low line width by the reduction of low frequency fluctuations.

WEp.15 Wed 13:30

Efficient Yb:BaY₂F₈ laser with widely tunable emission around 1.03 μm

— ●NICOLA COLUCELLI¹, ●GIANLUCA GALZERANO¹, PAOLO LAPORTA¹, ALBERTO DI LIETO², and MAURO TONELLI² — ¹Istituto di Fotonica e Nanotecnologie - CNR e Dipartimento di Fisica, Politecnico di Milano, Piazza L. Da Vinci 32, 20133 Milano, Italy — ²National Enterprise for Nano Science and Technology - CNR e Dipartimento di Fisica, Università di Pisa, Via F. Buonarroti 2, 56100 Pisa, Italy

Continuous-wave laser action was demonstrated in a novel Yb:BaY₂F₈ active crystal. A maximum output power of 570 mW at 3.7-W incident pump power and a maximum slope efficiency of 28% were obtained. The laser emission wavelength can be tuned from 1011 to 1061 nm.

WEp.16 Wed 13:30

Excitonic Excitation, Upconversion and Energy Transfer in Low Phonon Energy RE³⁺:KPb₂Cl₅ Laser Crystals (RE= Ho, Tm, Er, Yb)

— ●ALEXANDRA TKACHUK^{1,2}, SVETLANA IVANOVA^{2,3}, LUDMILA ISAENKO⁴, MARIE-FRANCE JOUBERT⁵, and YANNICK GUYOT⁵ — ¹Scientific Production Corporation "S.I. Vavilov State Optical Institute", 12, Birzhevaya line, 199034, St. Petersburg, Russia — ²University of Information Technology, Mechanics and Optics, 12, Birzhevaya line, 199034, St. Petersburg, Russia — ³LCMCP UMR 7574 CNRS - Université P&M Curie-ENSCP, Paris F-75235, France — ⁴Institute of Min-

eralogy & Petrography SB RAS, 43, Russkaya str., Novosibirsk, 630058, Russia — ⁵LPCML, UMR 5620 CNRS, Université Lyon 1, 69622 Villeurbanne Cedex, France

The emission spectra and energy transfer dynamics in RE³⁺:KPb₂C15 (RE=Ho, Tm, Er, Yb) crystals under UV excitonic and direct excitation of RE ions is studied at low and room temperatures using time-resolved spectroscopy under selective laser excitation. Efficient exciton-impurity, Er-Er and Yb-Er energy transfer and upconversion processes are demonstrated.

WEp.17 Wed 13:30

Spontaneous Emission in Nanocrystals for Laser Ceramics — ●YURI ORLOVSKII, TASOLTAN BASIEV, KONSTANTIN PUKHOV, OLIM ALIMOV, and PAVEL FEDOROV — General Physics Institute RAS, 38 Vavilov street, Bld. D, 119991, Moscow, Russia

Comparison of theoretical values calculated with modified equations and the experimental values of the decay time of metastable levels of rare-earth ions in nanocrystals with those in bulk crystals with same structure is done. Simple fluorescent kinetic method of shape control of nanocrystals for optical laser ceramics preparation is developed.

WEp.18 Wed 13:30

Growth and Spectroscopic Analysis of Tm:SrF₂ Crystal — ●FRANCESCO CORNACCHIA¹, MAURO TONELLI¹, REINHARD UECKER², and DETLEF KLIMM² — ¹NEST - INFN - CNR - Dipartimento di Fisica dell'Università di Pisa, Largo B. Pontecorvo 3, — ²IKZ - Institute for Crystal Growth, Max-Born-Str. 2, 12489 Berlin, Germany

We report on the novel material SrF₂ doped 5.2% with Tm³⁺ ions. We present our results regarding growth, absorption and emission spectroscopy as a function of the temperature, as well as Judd-Ofelt analysis in order to evaluate the potential use of SrF:Tm as active material for laser systems.

WEp.19 Wed 13:30

Thermal properties of the monoclinic laser host KLu(WO₄)₂ — OSCAR SILVESTRE¹, JOAN GRAU², ●MARIA CINTA PUJOL¹, JAUME MASSONS¹, MAGDALENA AGUILÓ¹, FRANCESC DÍAZ¹, MIECZYSLAW TADEUSZ BOROWIEC³, ANDRZEJ SZEWCZYK³, MARIA URSZULA GUTOWSKA³, MARTA MASSOT⁴, AGUSTIN SALAZAR⁴, and VALENTIN PETROV⁵ — ¹Física i Cristal·lografia de Materials (FiCMA). Universitat Rovira i Virgili. (URV). Campus Sescelades c/ Marcel·lí Domingo, s/n, 43007-Tarragona, Spain — ²Departament de Mecànica de Fluids, CEIB, Universitat Politècnica de Catalunya c/ Compte d'Urgell, 187, 08036-Barcelona, Spain — ³Institute of Physics, Polish Academy of Sciences, Al. Lotników 32/46, Pl 02-668, Warsaw, Poland — ⁴Departamento de Física Aplicada I, Escuela Técnica Superior de Ingeniería, Universidad del País Vasco, Alameda Urquijo s/n, 48013 Bilbao, Spain — ⁵Max-Born-Institute for Nonlinear Optics and Ultrafast Spectroscopy, 2A Max-Born-Str., D-12489, Berlin, Germany

Specific heat, linear thermal expansion ellipsoid and thermal conductivity ellipsoid of monoclinic KLu(WO₄)₂ were determined. The eigenvalues of the thermal conductivity are

2.95 Wm⁻¹K⁻¹, 2.36 Wm⁻¹K⁻¹, and 4.06 Wm⁻¹K⁻¹, with the maximum value along a direction in the a-b crystallographic plane, at 40.75° from the Ng principal optical axis.

WEp.20 Wed 13:30

Laser Performances Modelling From Concentration Quenching Analysis In — ●GEORGES BOULON¹, YANNICK GUYOT¹, and AKIRA YOSHIKAWA² — ¹University Claude Bernard, UMR 5620 CNRS, Villeurbanne, France — ²IMRAM, Tohoku University, 2-1-1 Katahira, Aoba-ku, Sendai, 980-8577, Japan

Prediction of the infrared laser performances from concentration dependences of the 2F_{5/2} experimental decay time in Yb³⁺-doped solid-state crystals mainly on cubic crystals as YAG, GGG, LuAG garnets, Y₂O₃ sesquioxides, CaF₂ and KY₃F₁₀ fluoride crystals with 4N purity which should be also helpful for ceramics.

WEp.21 Wed 13:30

Conceptual Design Scheme of High-Peak and High-Average-Power — ●YASUSHI FUJIMOTO and MASAHIRO NAKATSUKA — Institute of Laser Engineering, Osaka University

We evaluate the possibility of several laser media for constructing high peak and high average power laser system that have 92 beam lines with total energy of 3.45 MJ. Nd doped silica glass is considered as the most promising candidate.

WEp.22 Wed 13:30

High Beam Quality Diode Pumped 100 -W Green Nd:YAG Laser — ●IGOR GLUKHIKH¹, SERGEY DIMAKOV², SERGEY POLIKARPOV¹, and SERGEY FROLOV¹ — ¹D.V.Efremov Research Institute of Electrophysical Apparatus, Metallostroy 3, St. Petersburg 196641, RUSSIA, — ²Institute for Laser Physics, Scientific Center S.I. Vavilov State Optics Institute, Birzhevaya 12, St. Petersburg 199034, RUSSIA,

The frequency doubling 100W output power QCW diode pumped Nd:YAG laser is presented. The extracavity conversion efficiency of 30% and three diffraction limited green beam quality have been achieved.

WEp.23 Wed 13:30

Spectroscopic Characterisation and Energy Transfer in Tm-doped Sodium-Yttrium Double Fluoride Crystals (Tm³⁺:Na_{0.4}Y_{0.6}F_{2.2}) — ●SVETLANA IVANOVA^{1,2}, ALEXANDRA TKACHUK^{2,3}, ANASTSIYA MIRZAEVA³, and FABIENNE PELLE¹ — ¹LCMCP UMR 7574 CNRS - Université P&M Curie-ENSCP, Paris F-75235, France — ²University of Information Technology, Mechanics and Optics, 12, Birzhevaya line, 199034, St. Petersburg, Russia — ³Scientific Production Corporation "S.I. Vavilov State Optical Institute", 12, Birzhevaya line, 199034, St. Petersburg, Russia

We report on spectroscopic study of Tm:Na_{0.4}Y_{0.6}F_{2.2} crystals in order to evaluate their potential for application as active media of solid state tunable diode-pumped lasers emitting at ~1800nm. Mechanisms of population of the 3F₄ level under IR pumping at 792nm are discussed. Stimulated emission and gain cross-section spectra are calculated.

WEp.24 Wed 13:30

Room-Temperature, High Peak Power, Diode Pumped Tm:YLF Laser — •WALDEMAR ZENDZIAN¹, JAN JABCZYŃSKI¹, LUKASZ GORAJEK¹, JACEK KWIATKOWSKI¹, HELENA JELINKOVA², JAN SULC², and MICHAL NEMEC² — ¹Institute of Optoelectronics, Military University of Technology, Warsaw, Poland — ²Faculty of Nuclear Science and Physical Engineering, Czech Technical University, Prague, Czech Republic

Compact, acousto-optic Q-switched, Tm:YLF laser was developed. Above 7W at 1908-nm was obtained in free-running. 10.7 mJ energy, 22ns duration, corresponding to 450kW peak power was demonstrated for 10Hz rep. rate in Q-switching regime. 12kW peak power pulses with average power of 1.7W were achieved for 1000Hz.

WEp.25 Wed 13:30

Non-collinear sum frequency generation of femtosecond pulses in micro-structured BBO crystals — •CAROLINA ROMERO, JAVIER R. VÁZQUEZ DE ALDANA, CRUZ MÉNDEZ, and LUIS ROSO — Servicio Láser, Universidad de Salamanca, Pl La Merced SN, E37008 Salamanca, Spain

The third harmonic of a Ti:Sapphire femtosecond laser was obtained by non collinear sum frequency generation in a micro-structured BBO crystal. A diffraction grating was previously written with the same femtosecond laser for producing the off-axis propagation of fundamental and second harmonic pulses in the crystal.

WEp.26 Wed 13:30

Spectroscopic particularities of the garnet crystals and transparent ceramics and their implication on the laser emission — •VOICU LUPEI¹, AURELIA LUPEI¹, CRISTINA GHEORGHE¹, and AKIO IKESUE² — ¹National Institute of Laser, Plasma and Radiation Physics 077125 Bucharest, Romania — ²World Lab. Co. Ltd. 8656-8587 Nagoya, Japan

The rare earth doped single crystals grown from melt show departure from stoichiometry manifested by spectral satellites. In transparent ceramics the intensities of satellites are much smaller. The high-resolution data on these satellites in doped garnet crystals and ceramics are reported and their implication on the laser properties are discussed

WEp.27 Wed 13:30

Development of High-efficiency Yb:YAG Regenerative Amplifier for Industry — •ISAO MATSUSHIMA¹ and KAZUYUKI AKAGAWA² — ¹National Institute of Advanced Industrial Science and Technology (AIST), C2, 1-1-1, Umezono, Tsukuba, 3058568, Japan — ²Megaopto Co., Ltd., RIKEN Cooperation Center, 2-1 Hirose, Wako, Saitama 351-0198, Japan

We are developing a high-efficiency Yb:YAG regenerative amplifier for industrial applications. Optical-to-optical efficiencies have been theoretically calculated to determine efficient amplification conditions. Experimental results show an output pulse energy of more than 2 mJ before compression at a 10-kHz repetition rate with an optical conversion efficiency of 17.8%.

WEp.28 Wed 13:30

High repetition rate diode-pumped passively Q-switched Yb:YAG laser — •NIKOLAY KULESHOV¹, VICTOR KISEL¹, AURIMAS GALINIS², VYTAUTAS STOCKUS², and GINTAUTAS SLEKYS² — ¹Institute for Optical Materials and Technologies, BNTU, Nezavisimosty ave. 65, Minsk, 220013, Belarus — ²Altechna Co. Ltd., Konstitucijos ave., 23, C-604, Vilnius, LT-08105, Lithuania

Passively Q-switched Yb:YAG-Cr:YAG microlaser with repetition rate as high as 100kHz was demonstrated both in a single longitudinal mode and multimode operation. Average output power of 0.45W and 0.8W, and peak power of 1.5kW and 4.2kW were obtained for single-mode and multi-mode regimes, respectively.