TuR1-14 16:30-16:45

Cladding pumped Yb-free Er-doped fiber laser

Andrey Kurkov
Fiber Optics Res. Center of RAS, Russia

We have realized the cladding pumped Yb-free Er-doped fiber laser. To solve a problem of small pump power absorption and avoid Yb co-doping we used an active fiber with increased core diameter. Bragg grating written in the multimode fiber was used as an input reflector. The maximum output CW power of 4 W at 1600 nm was achieved. A slope efficiency of 31% was measured.

TuR1-15 16:45-17:00

All-fiber Er/Brillouin laser operating at ~778 nm

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1 - Service d'Electromag. et de Telecom., Fac. Polyt. de Mons, Belgium; 2 - Optoel. Res. Centre, Univ. of Southampton, UK; 3 - Lab. de phys. du solide, FUNDP, Belgium; 4 - Ioffe Physico-Technical Institute of RAS, Russia

25 mW-output-power-Er/Brillouin-oscillator and a periodically-poled optical fiber with a quasi-phase-matching resonance at 1.56 μm are the simplest way to realize nanosecond, all-fiber laser sources operating at 778 nm and 389nm. 25W-peak-power-pulse-train generated at 778 nm with 120 mW-diode-pumping is reported.

—COFFEE BREAK—

TuR1-16 *Invited* 17:30-18:00

High power InnoSlab lasers and nonlinear frequency conversion.

Dieter Hoffmann
Fraunhofer Inst. fuer Lasertechnik, Germany

The InnoSlab laser design and recent results including frequency conversion to green and UV are presented. Efficient generation and amplification of high power pulses from ns to ps range at high beam quality are discussed. Power scaling and principle limits are compared to other laser designs. Theoretical and experimental investigations on nonlinear frequency conversion at high average power are presented.

TuR1-17 *Invited* 18:00-18:30

Ultrashort-pulse lasers based on novel Yb-doped tungstate crystals.

Uwe Griebner
Max-Born-Institut, Germany

Passive mode-locking based on Yb^{3+}-doped monoclinic, disordered and epitaxial double tungstate crystals is presented. Sub-100 fs pulse durations in the 1-m spectral range were typically achieved, demonstrating the great potential of Yb-doped tungstates for ultrashort-pulse laser systems.

TuR1-18 18:30-18:45

The present status of the LUCIA project, a 1 kW class diode pumped solid state laser chain.

G. Bourdet[1], H. Yu[1,2], A. Fülöp[1], J.-C. Chanteloup[1], S. Le Moal[1]
[1]Laboratoire pour l'Utilisation des Lasers Intenses (LULI), École Polytechnique - CNRS - CEA- Université Paris 6, France; [2]Research Center of Laser Fusion, China

The Laboratory for Use of Intense Laser (LULI) is building a high average power diode pumped solid state laser chain (100 Joules/10 Hz/10 ns). In this paper, we investigate the choice of the amplifier medium, the pumping, extraction and cooling architectures and we analyze the thermal problems we met. The most recent developments of the oscillator and the amplifier and the last results obtained will be exposed.

TuR1-19 18:45-19:00

Tabletop 100 J 1 ns Nd:glass laser with 3 diffraction-limited beam divergence.

Shaykin A.A., Katin E.V., Khazanov E.A., Kirsanov A.V., Luchinin G.A., Malshakov A.N., Martyanov M.A., Poteomkin A.K.
Inst. of Appl. Phys. of RAS, Russia

A tabletop 100J 1ns Nd:glass laser is designed and constructed. The laser parameters are as follows: wavelength =1054nm, t = 1.4ns, W = 100 J, active element diameter =100mm, fill factor ~0.6, divergence ~30 μrad. The laser radiation can be efficiently (about 60%) converted into second harmonic. Laser is stable enough for operation at 20 flashes/day. The laser scheme is currently being modified to achieve energies ~300 J.

TuR1-20 19:00-19:15

High brightness 3J/100Hz Nd:YAG Q-switched MOPA laser

A.F. Kornev, I.G. Kuchma, D.O. Oborotov, V.P. Pokrovskiy, L.N. Soms, V.K. Stupnikov, S.S. Terehov
ILPH Vavilov State Optical Institute, Russia

We describe a Nd:YAG master oscillator - double-pass amplifier (MOPA) laser with a phase conjugated mirror based on stimulated Brillouin scattering (SBS-PCM). The amplifier had 4 laser heads with Nd:YAG 15 mm and 10 mm pumped by flash lamps. 90°-quartz rotators were used to compensate for birefringence in the tandem laser head. Residual birefringence was compensated by Faraday rotator together with SBS-PCM.

TuR1-21 19:15-19:30

Drastic reduction of heat release in magneto-optical elements: new ways towards 100 kW average power Faraday isolator

D.S. Zheleznov, E.A. Khazanov, I.B. Mukhin, O.V. Palashov
Institute of Applied Physics of RAS, Russia

Faraday isolators with low heat release are created. The heat release is reduced either by shortening the optical element (due to cooling to nitrogen temperatures or use of superconducting magnets) or by employing non-traditional magneto-optical media with better thermo-optical properties. It is shown that the suggested ways make it possible to create a Faraday isolator that for 100kW average power.

R2. High Power Gas Lasers

Co-chairs: O. B. Danilov, Ja. Kodymova

TuR2-01 09:00-09:15

Development of COIL with chemically generated atomic iodine

Miroslav Censky, Otomar Špalek*, Vit Jirasek*, Jarmila Kodymova*, Ivo Jakubec***
*Institute of Physics, Academy of Sciences CR, **Institute of Inorganic Chemistry, Academy of Sciences CR, Czech Republic

Two alternative methods of chemical generation of atomic iodine for a chemical oxygen iodine laser (COIL) were proposed and experimentally investigated. Results on atomic iodine generation, suitable injection into the laser cavity, and small signal gain measurements will be presented.

TuR2-02 *Invited* 09:15-09:45

Detailed diagnostic study of the iodine dissociation in a highly efficient supersonic COIL

B. Barmashenko, V. Rybalkin, A. Katz and S. Rosenwaks
Dept. of Phys., Ben-Gurion Univ. of the Negev, Israel

Direct measurements of the dissociation of I_2 molecules at the optical axis of a supersonic chemical oxygen-iodine laser were carried out. This enabled to determine the number of consumed O_2 molecules per dissociated I_2 molecule. Possible dissociation mechanisms consistent with our results are discussed.

TuR2-03 *Invited* 09:45-10:15

Perspective methods for the generation of COIL gain medium

V.D. Nikolaev, M.I. Svistun, N.A. Khvatov, M.V. Zagidullin,
P.N. Lebedev Phys. Inst. of RAS, Samara Branch, Russia

A high pressure centrifugal bubble singlet oxygen generator is developed for the supersonic COIL. A simplified model has been developed for the prediction of the centrifugal SOG performance. The results of the experimental parametric tests of this SOG are presented. A supersonic ejector COIL powered by this SOG has demonstrated high chemical efficiency.

TuR2-04 10:15-10:30

Pulse-periodic chemical oxygen-iodine laser with active medium formation by volumetric electric discharge

Velikanov S.D., Kalinovsky V.V., Konovalov V.V., Sevryugin I.V.
Russian Federal Nuclear Center - VNIIEF, Russia

The paper describes a study of pulse-periodic operation of a chemical oxygen-iodine laser. Atomic iodine required for lasing was obtained by dissociating methyliodide in volumetric electric discharge. Steady lasing was achieved at a repetition rate up to 30 Hz.

TuR2-05 *Invited* 10:30-11:00

Resonators for High Brightness COIL

Karin Maria Gruenewald
DLR, Inst. of Techn. Phys., Germany

High brightness performance of chemical oxygen iodine lasers (COIL) requires resonator architectures that enable the efficient extraction of laser power from low gain medium and the attainment of beam quality close to the diffraction limit. Furthermore the resonators shall provide easy adjustment procedures and stable output performance. Resonator configurations designed and tested for multi Kilowatt COIL as well as promising approaches will be depicted and discussed within the presentation.

—COFFEE BREAK—