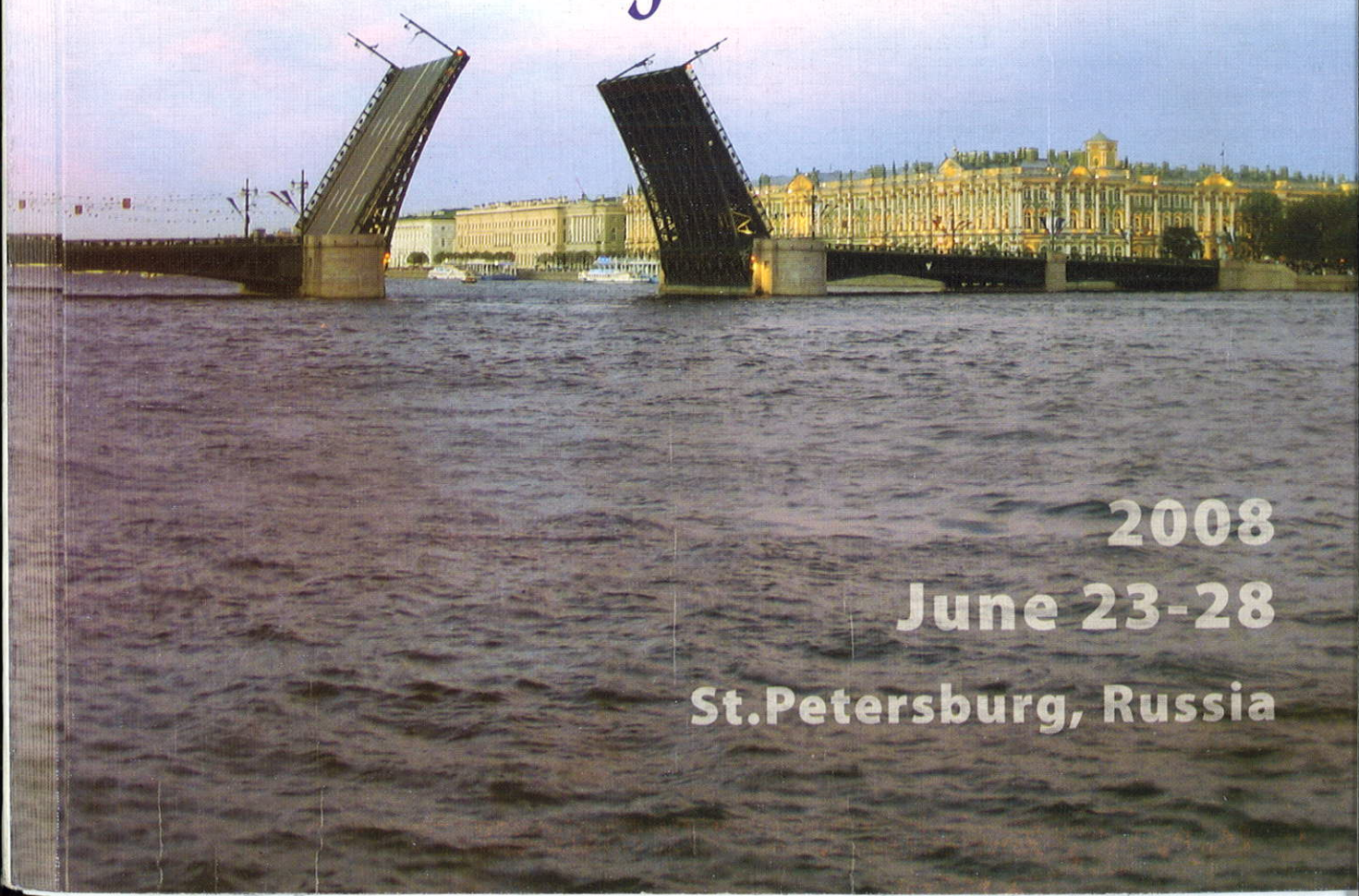
LASER OPTICS
ОПТИКА ЛАЗЕРОВ
2008

International Conference

«Laser Optics 2008»

Technical program



2008
June 23-28
St.Petersburg, Russia

ThR1-p29

Mode-Locked Oscillators in the Positive and Negative Dispersion Regimes: Scenarios of Destabilization

V. L. Kalashnikov, E. Sorokin
Inst. fuer Photonik, Vienna, Austria

We analyze the influence of spectrally modilated dispersion and loss on the stability of mode-locked oscillators. In the negative dispersion regime, a soliton oscillator can be stabilized in a close proximity to zero-dispersion wavelength, when spectral modulation of dispersion and loss are strong and weak, respectively. If the dispersion is close to zero but positive, we observe "chaotic" mode-locking or a stable coexistence of the pulse with the CW signal. The results are confirmed by experiments with a Cr:YAG oscillator.

ThR1-30

Limiting Efficiency of SFG of Femtosecond Pulse in Medium with Combined Nonlinear Response

Vyacheslav A. Trofimov, Vladislav V. Trofimov
Lomonosov Moscow State Univ., Moscow, Russia

We investigate maximum achievable efficiency of SFG of femtosecond pulse. This analysis is made on the base of obtained explicit solution of set of Schrodinger equations in the frame-work of long pulse approximation. Our analysis is proved by computer simulation made for nonlinear Schrodinger equations.

June 26
15:00-20:00

ThR1-p31

kW Diodes-Pumped Solid-State Heat Capacity Laser with Several Diffraction Limited

Cai Zhen
Insitute of applied electronics, China

The study on technique of beam quality controlling has been done, coupling system was optimistically designed by means of lens compression and wave-guide equality to get the uniform of gain distribution to 85%,at the same time, seven times diffraction limit laser output was gotten through instable cavity.

ThR1-p32

Pulse Interval Jitter and Lower Limit to a Pulse Repetition Rates of Diode-Pumped Passively Q-switched Solid-State Laser

A.F.Shatalov, M.I.Belovolov
Fiber Optics Research Center of the Russian Academy of Science,

Pulse interval jitter σ and lower limit F_L to a pulse repetition rates F of diode-pumped passively Q-switched $Ca_3Ga_2Ge_3O_{12}:Nd^{3+}$ (CGGG:Nd) and YAG:Nd lasers are investigated.

Repetition rates F of CGGG:Nd and YAG:Nd lasers were varied in ranges (3÷13) kHz and (4÷35) kHz, respectively. YAG:Cr^{3+} crystal was used as saturable absorber.

It is found that σ depends on F as $\sigma = (A/F^{\gamma})$. It is shown that $F_L = A^{1/(\gamma-1)}$. Parameters γ, A, FL are mesaured, which are 1,3; 0,2 (kHz)γ-1, 5 Hz and 1,4; 0,18 (kHz)γ-1, 14 Hz for CGGG:Nd and YAG:Nd lasers, respectively.

ThR1-p33

Effect of Flow Field Characteristics in Liquid Laser System on Thermally Induced Distortion

Xu Zheng, Yuan Yongke, Li Mi, Yan Feng, Zhang Wei, Su Yi
Institute of Applied Electronics, Sichuan, China

Inorganic liquid laser system excited by semiconductor diode laser avoids the heat deposition problem similar in solid state heat capacity laser by using circulation flow way. It is probably to realize long-time continuous laser output and get good beam quality. The turbulent flow existing in the circulation flow way, however, affects optical propagation and thermally induced distortion much. All above need further discussion. By now, this inorganic liquid laser system has success to produce output laser in static system and reach high optical-optical conversion efficiency. The turbulent flow exists in the circulation flow system when liquid laser medium flows at high velocity in the channel. In order to describe the effect on wavefront thermally induced distortion of boundary layer effect and temperature disturbance in the liquid laser medium channel, numerical simulation using Fluent 6.53 has been taken with fluid mechanics and optical theory.

ThR1-p34

Self-Compensation of Thermal Lens in High-Power Diode Pumped Solid-State Lasers

Xiao-Jun Wang
Institute of Applied Physics and Computational Mathematics, China

We present a comprehensive model to describe the optic-thermal coupling in the diode pumped solid-state lasers (DPSSL). The thermal transition of particles at the upper laser level makes that heat generation of the laser crystals depends on shape of the laser beam, while the laser field is also influenced by the temperature by means of the thermal partition of doped particles. These effects, together with the usual thermal-optic effect, leads to a complicated coupling between the laser field and the temperature field. We show that the optic-thermal coupling plays an important role in high-power DPSSL with larger size beam. That effect may yield a self-compensation for the thermal lens and improve the beam quality.

ThR1-p35

Laser Effect in Photonic Crystal Structures with Activated Glass

Olga N. Kozina
Saratov Division of the Institute of Radio-Engineering and Electronics, Russia

We present the theoretical and numerical approach to the computation ofthe lasing from 1D and 2D photoniccrystal structures with active medium for nonlinear case. We used thetransfer matrix formalism for studying theamplification in a photonic crystal. The lazing optimum condition isdetermined. The parameters of photonic crystal laserbased on activated glasses can choose by this method.

ThR1-p36

Photonic Crystal For Continuous Wave UV Lasing

Y. V. Radeonychev and I. V. Koryukin
Institute of Applied Physics RAS, Russia

Use of 3D and 2D photonic band-gap structures for decrease of laser threshold and increase of efficiency of laser operation is proposed. This enables to develop cw ultraviolet all-solid-state laser as well increase efficiency of laser operation in optical range.