DPSS LASERS PRODUCED BY LOTIS TII

V.A. Zaporozhchenko, Y.V. Zaporozhchenko, A.V. Karankevich, V.S. Mezen,
N.N. Vasiliev, N.A. Tylets, L.A. Fedorov
LOTIS TII, Minsk, Belarus

Production of DPSSL by LOTIS TII was begun in 2003 from release of laser LS-1321 on crystal LSB:Nd^{3+} with longitudinal pump by the continuous wave laser diode. The laser had two modifications: Q-CW with passive Q-switching and CW TEM00 mode. However the given model has not received further the development owing to a wide scatter of target parameters at a batch production of the laser because of low quality of used microchips (active elements).

In 2010 the company began development of DPSSL with ns and ps pulse duration aimed for expansion of laser models and, increase pulse repetition rate (prr) up to 1кHz.

As a result of the carried R&D we propose a line of electro optical Q-switched (LS-2149) and active mode locking (LS-2152) lasers for scientific applications and special models for technology and medicine applications. The main output parameters of lasers are given in Tab. 1.

Model	Output λ, nm	Prr, Hz	Output energy, mJ	M2	Pulse duration, ns
LS-2149-100	1064; 532	100	30; 15	5	10
LS-2149TEM00	1064 ;532	100	10; 5	1,5	10
LS-2149/213	213	500	1	1,5	
LS-2149-500	1064; 532	500	25; 12	5-7	10-12
LS-2149-1000	1064 ;532	1000	20; 10	5-7	10-12
LS-1321	531 531; 265,5	CW Q--CW Q CW 10-100 kHz	70mW 60mW 1 mW	< 2	2ns
LS-2152	1064; 532	500	1,2; 0,7	<1,5	100 ps

Despite of usual DPSSL lasers with prr ~ 1 kHz we use not CW excitation but pulse pump that allows increasing pump efficiency and optimizing the pump pulse duration. Nevertheless, it is necessary to note, that development of lasers with prr more than 100 Гц has demanded the decision of the questions connected to thermal

effects in active elements that in the certain degree limits a choice of cavity optics and design of laser resonator. The original laser cavity provides compensation of active rod birefringence and thermal lens. As a result of our know-how we propose the following models: TEM00 laser with output wavelength 213 nm for eye correction system, the technological laser for shaped glasses cutting etc. The DPSS Laser with active mode locking LS-2152 is further development of reliably recommending in the market of the flash lamp pumped laser LS-2151 and differs by compactness and high pulse repetition .rate, keeping all advantages of lamp model: small jitter, an opportunity of exact synchronization with external devices etc.

All models include a laser emitter, a power supply, thermoelectric cooling unit and remote control (RC). Laser LS-2152 is completed with the controller and PC. The control of lasers LS-2149 is made from board RC or PC.

Typical LS-2149 output spot is shown at fig.1.

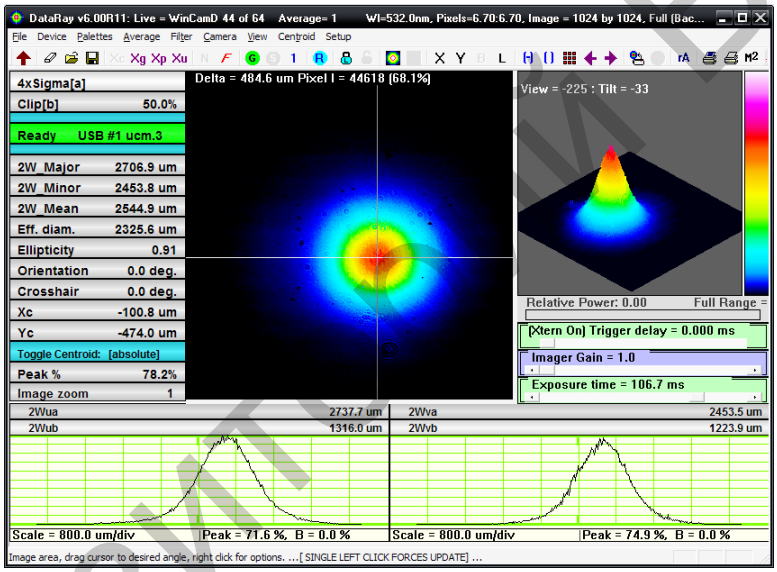

Fig. 1. LS-2149 second harmonic spot (100 Hz, 16 mJ, 532 nm, near field)