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CONFERENCE ABSTRACTS

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Abstracts

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This book contains the materials on the fundamental and applied problems of pulsed lasers. It may be interesting for researches and engineers working in the sphere of quantum electronics, spectroscopy, plasma physics, medicine, remote sensing and laser technologies.

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concentration of oxygen and carbon in the surface layers of the copper from the number of pulses discharge action.

The work is aimed at finding possible ways to use this type of discharge in science and industrial production.

The work is performed in the framework of the Russian Science Foundation (the Project 14-29-00052).

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BIREFRINGENCE OF $GASE_{1-X}S_X$, $X = 0–0.44$, CRYSTALS AT MID-IR AND THZ RANGE

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Layered solid solution crystals $GaSe_{1-x}S_x$ are among the most attractive for frequency conversion within extreme wide range 0.6–20 μm and from 50 μm further into the THz range, as well as for application in polarization optics. Successful design and fully exploitation of $GaSe_{1-x}S_x$ crystals calls for adequate data on dispersion versus mixing ratio of the ordinary and extraordinary wave refractive indices. The layered structure limits processing and measurement of the e-wave dispersion resulting in scattered data for long wave mid-IR range. Among 12 known couples of dispersion equations for parent GaSe crystal, only four of them demonstrate reasonable behavior in the THz range. These equations show huge different birefringence from 0.49 (equations recommended by the widest use Handbook) to 0.78 (most closed to very few available experimental data). A range of high optical quality $GaSe_{1-x}S_x$ and GaSe crystals were grown from the melt by the modified vertical Bridgman technology and processed by designed technique for measurement of both o- and e-wave dispersions. They were studied by THz time-domain spectroscopy. Adequate data were selected by using of proposed criteria. New dispersion equations were designed for the entire transparency range that show THz birefringence $B = 0.79$, in good coincidence with known experimental data.

This study was supported by The Tomsk State University Academic D.I. Mendeleev Fund Program (research Grant No. 8.1.51.2015).

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ND : YAG/CR : YAG COMPOSITE LASER CERAMICS

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Currently, thin disk lasers have attracted much interest as the most high-developing type of lasers. The thickness of the disk (100–300 μm) is much lower than the diameter that may cause the formation of «parasitic» oscillation in the radial direction leading to degradation of the efficiency or suppression of laser oscillation. It can be avoided using combination of active medium with reflectionless absorbing material, for instance, Cr : YAG containing Cr^{4+} ions [1].

In this work we report on the synthesis of composite ceramics consisted of central highly transparent ceramic Nd : YAG element and Cr : YAG cladding. Central segments of the ceramic disks with the diameters of 18 and 23 mm were full circle of Ш14-mm-diameter or squarewise of 11 mm, respectively. The thickness of the samples was ~ 3 mm.