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**PULSED LASERS AND LASER APPLICATIONS**

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**ABSTRACTS**

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## SYNTHESIS AND GROWTH OF THE BORATE CRYSTALS FOR NONLINEAR APPLICATIONS

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The report presents the results of growing two well known borate crystals for nonlinear optics. The first is the crystal of lithium threeborate  $\text{LiB}_3\text{O}_5$  (LBO), which is used to convert submicron laser radiation into the second and third harmonics. LBO is characterized by high damage threshold, therefore it is increasingly used in high power wide aperture laser systems due to significant progress in the production of large crystals.

The second is the crystal of the low temperature phase of barium metaborate  $\beta\text{-BaB}_2\text{O}_4$  (BBO), which is used to convert laser radiation in the near ultraviolet region.

Both crystals are grown by methods of melt-solution crystallization. The originality of our approach consists in the creation of statically and dynamically inhomogeneous heat fields during the growth of these crystals.

The report also considers the conditions for obtaining noncentrosymmetric three-cation scandium borates with the general formula  $\text{Ln}'_x\text{Ln}''_y\text{Sc}_z(\text{BO}_3)_4$  ( $x + y + z = 4$ ) with various combinations of lanthanides Ln. The absence of a symmetry center and the presence of rare-earth cations in the structure make these compounds promising for the purpose of self-doubling of laser radiation.

The work is carried out according to the basic Project of the IGM SB RAS No. 0330-2019-0008, the study of three-cation scandium borates is supported by the RFBR Grant No. 19-05-00198a.

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## GENERATION OF THz EMISSION IN FEMTOSECOND LASER INDUCED FILAMENT

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The results of experimental studies of the conditions for generating THz emission in laser filament created by focused ultrashort laser pulse of Ti: Sapphire complex are presented. The influence of the magnitude and direction of applied external electric field, energy, polarization of pump radiation in one and two color optical schemes on the intensity, divergence, and polarization of THz radiation was investigated. THz spectra was estimated and optimal generation conditions are discussed.

The reported study was supported by Russian Foundation for Basic Research Project No. 19-48-703027.

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## ANGULAR DISTRIBUTION OF THz RADIATION GENERATED IN PLASMA OF SINGLE COLOR FILAMENT

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Plasma formed during filamentation of ultrashort laser pulses is one of the sources of terahertz (THz) radiation.