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ABSTRACTS

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Y-24

FORMATION OF THE SCATTERING PHASE FUNCTION IN THE INTERACTION OF ULTRASHORT LASER PULSES WITH A DROP IN A NONLINEAR MODE

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The propagation of ultrashort laser pulses in the atmosphere is accompanied by nonlinear effects. The most low-threshold of them is the effect of cubic nonlinearity along with nonlinear absorption manifesting in aerosol. This effect should lead to the transformation of the scattering phase function formed in a liquid droplet aerosol. To study this effect, numerical and experimental studies on droplets of various sizes and geometries were carried out. As expected, the cubic nonlinearity inclusion should lead to an increase in the effect of backward scattering.

The reported study was funded by RFBR and Tomsk region according to the research Project No. 19-42-703015.

Y-25

PROSPECTS OF CONTROLLING THE PROPAGATION OF HIGH POWER THZ RADIATION BY PASSIVE OPTICAL ELEMENTS INCLUDING 3D PRINTED

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Different types of optical elements for controlling high power THz radiation were studied. Controlling was performed utilizing amplitude modulation of the electric field and effective spatial modulation of the complex dielectric susceptibility in the volume of the THz filter. We make a comparison of attenuation efficiency of various options of 3D printed filters when ABS filament is mixed with perovskite microparticles. Another type of filter was obtained by the deposition of magnetic particles in the presence of an external magnetic field in a transparent polymer matrix. Industrial isotropic cut-off filters based on layered meta structures have also been investigated. A comparison is made of the efficiency of attenuation of linearly polarized THz radiation with homemade band-pass polarizers obtained by etching copper from a flexible polyimide substrate and industrial filters. Filters and polarizers created using 3D printing, or by deposition of polymer matrix with magnetic particles under external field, are attractive cost effective elements.

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Y-26

DEVELOPMENT OF SERS SUBSTRATES BASED ON NANOPARTICLES OBTAINED BY PULSED LASER ABLATION

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SERS spectroscopy is an effective method for the determination of organic and biological compounds, which finds its place in many areas of human life: the analysis of works of art and food