

Lowering Raman threshold in liquids embedded into photonic crystals or photonic glasses

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Stimulated Raman scattering in photonic crystals and photonic glasses with embedded molecular liquids is studied under excitation by picosecond laser pulses. Substantial decrease of Raman threshold was observed when focused laser beam excited substance inside of photonic structures. Such phenomenon was explained as the result of large enhancement of laser radiation field due to Mie resonance or whispering gallery modes effects. Raman threshold reducing in photonic crystals and photonic glasses opens the way to creating new efficient laser sources based on Stimulated Raman scattering in photonic structures.

Polarization multiwave mixing of Gaussian and singular light beams in dye solutions

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Results of the study of polarization dynamic holograms formed under multiwave mixing of Gaussian and singular light beams in dye solutions are presented. It was shown that for any combination of polarizations of the interacting waves, the topological charge, contributed in formed dynamic hologram, is transmitted to conjugate wave, and it is equal in absolute to that of the signal wave. The dependence of the orientation of the polarization plane of the conjugate wave on the relative orientation of the polarization planes of the interacting waves has been established.

Spectral dependences of optical absorption for vacuum annealed Bi₁₂SiO₂₀ crystals

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We have investigated the spectral dependences of the optical absorption of Bi₁₂SiO₂₀ crystals, subjected to vacuum annealing in the temperature range from 650 to 780 °C; and subsequent annealing in the air atmosphere at the