

Dynamics observation of pressure waves during femtosecond laser irradiation in amorphous silica glass

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Glass is one of high-performance materials used in a wide variety of field owing to its high mechanical and electrical insulating properties, chemical and thermal resistance, and transparency. For improving the accuracy and quality of laser processing, measurement of pressure waves leads to evaluation of the state of the processed material and optimization of processing parameters.

In this study, we observed the propagation of pressure waves during the laser processing of transparent dielectric materials using pump-probe method. The stress intensity and direction in the material is evaluated by calculating the birefringence of isotropic materials. Figure 1 shows the representative transmission images that measured the processing of amorphous silica glass. Multiple pressure waves were measured, including P and S waves. We report a detailed observation of the stress of pressure waves generated during laser processing.

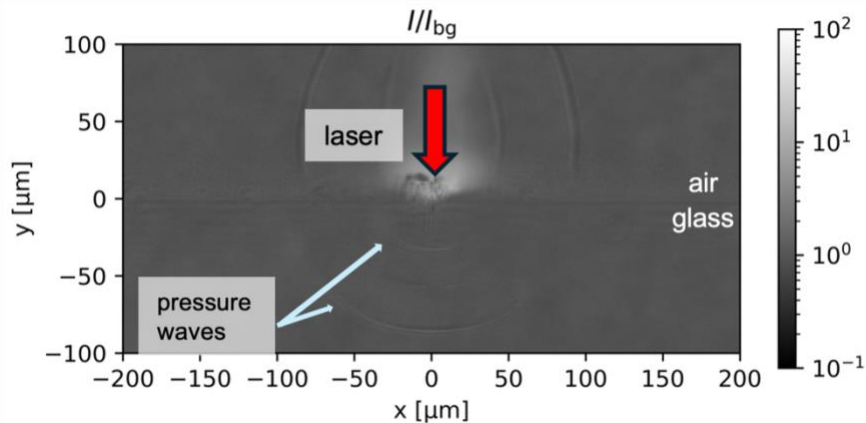


Figure (1): Transmission images of side of silica glass delay time of 16 ns
The gray-scale value indicates the ratio of light intensity with and without the pump source.

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