

Abstract Submitted
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A study on the interactions between femtosecond-pulse laser and water from a viewpoint of multiphase flows¹ TAKAYUKI SAITO, DAIJI SONE, MANABU YAMAMOTO, SHINGO OISHI, SHIN-ICHIRO AOSHIMA, Shizuoka University — Femtosecond-pulse lasers (fs pulses) cause very interesting phenomena due to their extremely high energy density. The effects on substances are not thermal, but multi-photon absorption. When this multi-photon absorption of fs pulses operates on water, extraordinary phenomena different from laser-induced cavitation by usual laser such as nano- or pico-pulse laser are induced. Fs pulses of 60 femtoseconds in duration, 1kHz in repetition rate and $0.2\text{--}0.9\mu\text{J}$ in pulse energy are focused at pure water in a glass cell through several types of lens. The fs pulses split from original beams through a beam splitter are used as probe light. The Femtosecond-order Time-resolved Optical Measurement is realized by adjusting a light path length of the probe light (fs pulses). We elucidate the changes of refraction index of the water, the bubble generation process and the bubble properties. On the basis of these results, we discuss a relationship between the bubble motion and the field irradiated by fs pulses.

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