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Highly time-resolved measurement for bubble nucleation induced by femtosecond laser pulses YUKI MIZUSHIMA, Graduate School of Engineering, Shizuoka University, TAKAYUKI SAITO, Graduate School of Science and Technology, Shizuoka University — Femtosecond laser pulses (fs pulses) lead very interesting phenomena due to their extremely high energy density. The effects on substances are not thermal, but are multi-photon absorption. When this multi-photon absorption of fs pulses operates on water, extraordinary phenomena different from laser-induced cavitation by a usual laser such as nano-pulse laser are induced. In this study, fs pulses were focused on ultra-purified water in a glass cell through several types of lens. Some fs pulses split from original beams through a beam splitter were used as probing light of femtosecond order. Femtosecond-order time-resolved optical measurement was realized by adjusting a light path length of the probing light. We found out strange time-series process of refraction index changes of the water irradiated by the fs pulses, and the bubble nucleation and bubble growth, and the interesting bubble properties. Based on these results, we discuss a relation between those and fs-pulse peak intensity. Further, we discuss the nucleation and growth process from femtoseconds to picoseconds.

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