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Experiment and analysis of shock waves radiated from pulse laser focusing in a gelatin gel[1] NOBUYUKI NAKAMURA, KEITA ANDO, Keio Univ — A fundamental understanding of shock and bubble dynamics in human tissues is essential to laser application for medical purposes. Here, we experimentally study the dynamics of shock waves in viscoelastic media. A nanosecond laser pulse of wavelength at 532 nm and of energy up to 2.66 0.09 mJ was focused through a microscope objective lens (10 x, NA = 0.30) into a gel of gelatin concentration at 3 and 10 wt%; a shock wave and a bubble can be generated, respectively, by rapid expansion of the laser-induced plasma and local heat deposition after the plasma recombines. The shock propagation and the bubble growth were recorded by a ultra-high-speed camera at 100 Mfps. The shock evolution was determined by image analysis of the recording and the shock pressure in the near field was computed according to the Rankine-Hugoniot relation. The far-field pressure was measured by a hydrophone. In the poster, we will present the decay rate of the shock pressure in the near and far fields and examine viscous effects on the shock dynamics.

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