

Abstract Submitted
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Simultaneous multi-point laser ablation using a spatial light modulator¹ AROSHAN JAYASINGHE, SHANE HUTSON, Dept. of Physics & Astronomy, Vanderbilt University, Nashville, TN — Laser-microsurgery has emerged as a powerful technique for evaluating in vivo tissue mechanics; however, for incisions involving multiple pulses, only the very first pulse ablates tissue with unaltered mechanical stress; subsequent pulses ablate tissue that is recoiling from earlier ablations. To avoid this, we have developed a system for simultaneously ablating tissue at several points by using a single laser pulse shaped by a phase-only spatial light modulator (SLM). The ablating laser system is connected to a confocal microscope with a high-speed camera attachment. Using the high-speed camera and pulsed illumination, we have imaged the dynamics of multi-point ablation – including the formation and interaction of multiple simultaneous plasmas and cavitation bubbles. We report preliminary results from simultaneous ablation of multiple spots and/or extended lines in aqueous solution, gels and fruit fly embryos.

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