



Optical and ultrasound imaging of shear wave generated by laser induced cavitation bubbles

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While active shear wave elastography for creating tissue elasticity map has mushroomed over the years, there are only a few kind of sources for shear generation utilised in medical applications. Here we show that the oscillations of non-spherical bubbles can generate shear wave in a tissue mimicking material. These bubbles may form in thermal ablation or from non-linear absorption of pulsed laser beams. Here we report on shear waves generation from laser induced cavitation bubbles. Using a thin layer of graphite powder allows measuring optically with high-speed imaging and acoustically with plane wave imaging the shear wave propagation. A comparison between both methods demonstrates excellent agreement. The long term aim of the research is to utilise naturally occurring bubble oscillation during thermal tissue ablation for a shear wave based thermal dose quantification.