**Optical imaging of shear wave generated by non-spherical cavitation bubble collapse in a tissue phantom**

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**Abstract**

While active shear wave elastography for creating tissue elasticity maps has received a lot of attention, only a few kinds of sources for shear generation are presently utilized in medical applications. Shear wave can be generated using acoustic radiation force or from external sources. Also, the formation and dynamics of bubbles within tissue can be another source for shear wave generation. These bubbles may be generated by focused acoustic waves, thermal ablation leading to out-gassing, or the reflection of shock waves from sound soft boundaries. Here we create single and well-controlled cavitation bubbles using a focused laser pulse close to a solid boundary. Connecting the particular dynamics of bubble with the kind of shear wave generated in a tissue-mimicking hydrogel, we observe two different shear waves travelling parallel and perpendicular to the boundary depending on the distance of bubble to the boundary. For close distances of the bubble most of the shear wave energy is radiated upwards, while for large distances the shear wave travels parallel to the boundary.