Supplemental material : Experimental setup for schlieren imaging

Schlieren imaging is a well-known technique for imaging optical index gradients [1]. It has been extensively used for visualising compressible flows, acoustic waves or thermal plumes. Here we detail the schlieren setup used for imaging the evanescent acoustic field set up close to a solid substrate.

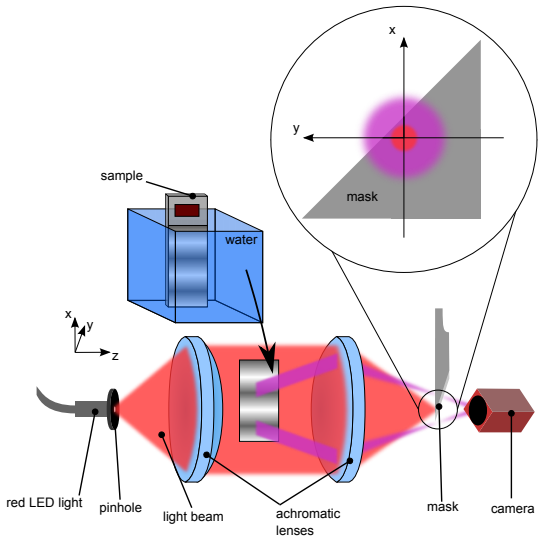

FIG. 1. Bottom : Sketch of the optical bench implemented for schlieren imaging. Non-deviated light beam is represented in red colour, the deviated beam in light purple. Top-right corner : zoom on the spectral filtering mask together with the non-deviated (red) and deviated light (purple) spots.

A piezoceramic transducer (*Noliac* NCE51) is glued on an optical glass (BK-7) plate with dimensions 60 mm × 24 mm × 150 μm. The glass plate is partially immersed vertically in a quartz container filled with pure water. The piezoceramic is excited in sine mode by a function generator coupled with an *AR* 75A250A power amplifier. A standing, surface acoustic wave is set up along the plate. The plate is inserted in the path of the schlieren imaging setup for pressure field imaging.

The optical bench is set horizontal while the plate is immersed vertically into the water so that the plate surface is parallel with the light rays. The light source is a red *CoolLED* LED (wavelength in vacuum 660 nm). A pinhole (diameter 50 μm) is used to generate a point-like light source. This pinhole is located in the focal plane of a spherical achromatic lens (diameter 50.8 mm, focal length 100 mm). The resulting parallel light beam illuminates the plate. Another identical lens focuses the light transmitted by the plate at a point where a scalpel blade acts as a spectral filter. The blade orientation is at 45° from vertical in order to maximize the contrast of schlieren imaging. The resulting image is recorded using a CCD camera (Pike F421B, *Allied Vision Technologies*) with no mounted lens. The 10 ms exposure duration being much larger than the acoustic period (of typical order of magnitude 1 μs in the investigated frequency range), the pictures recorded by the CCD camera correspond to an average in time of the schlieren image of the standing acoustic field.

Recorded pictures are analysed using *ImageJ* software. The light intensity pattern acquired in absence of acoustic wave is substracted.

Some resulting pictures are shown in figure 2 for three different frequencies.

[1] G. S. Settles, "Schlieren and shadowgraph techniques: Visualizing phenomena in transparent media," (Springer Berlin Heidelberg, Berlin, Heidelberg, 2001) Chap. Specialized Schlieren Techniques, pp. 111–141.

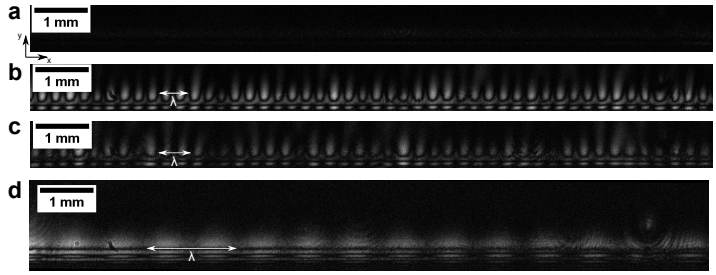

FIG. 2. Resulting schlieren images after background subtraction of a glass plate partially immersed in pure water (a) without acoustic excitation, (b) with surface acoustic wave (SAW) of frequency $f = 2715\ kHz$ (c) 2515 kHz (d) 287 kHz.