

Optofluidic holographic microscopy with custom Field of View by a linear array detector

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Supplementary information

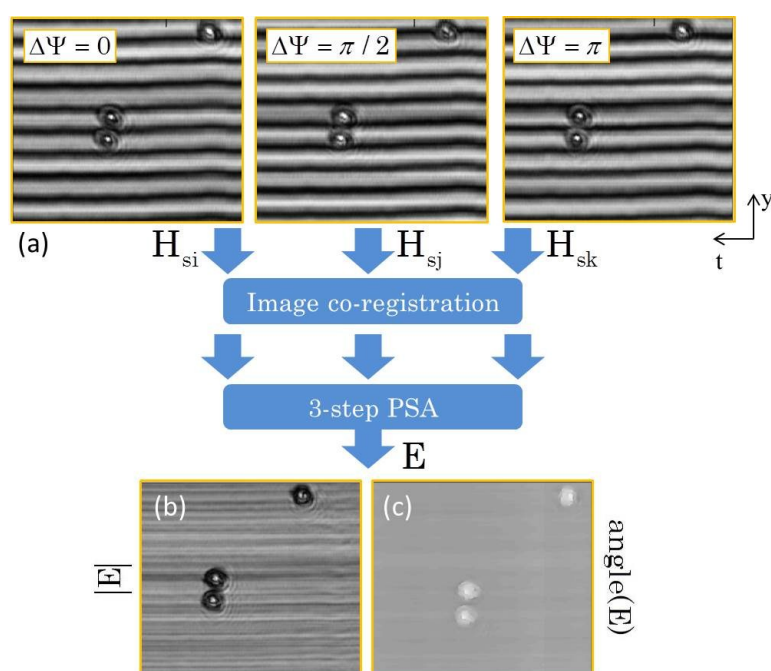


Fig. S1 Working principle of PS-μSTSI. Polystyrene beads are let flow along the channel at constant velocity. (a) Three synthetic interferograms shifted each other of proper phase steps are used to estimate the complex object field, E . (b) Amplitude reconstruction. (c) Phase contrast image.

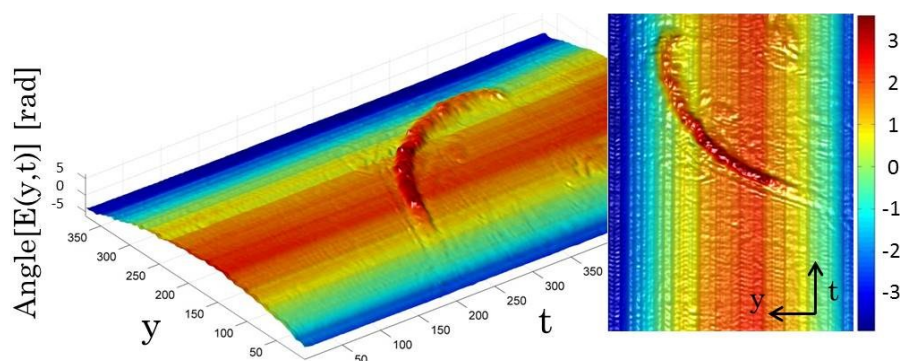


Fig. S2 Unwrapped phase-contrast map obtained with a 3-step PS algorithm. The curvature in the phase map is due to the channel shape. In fact, the phase values, obtained by the adopted algorithm, contain the contribution due to all the objects (e.g. optics, microfluidic channel) located in the interferometer “object” arm. After compensating this curvature the phase map shown in Fig. 4 (d) is obtained.

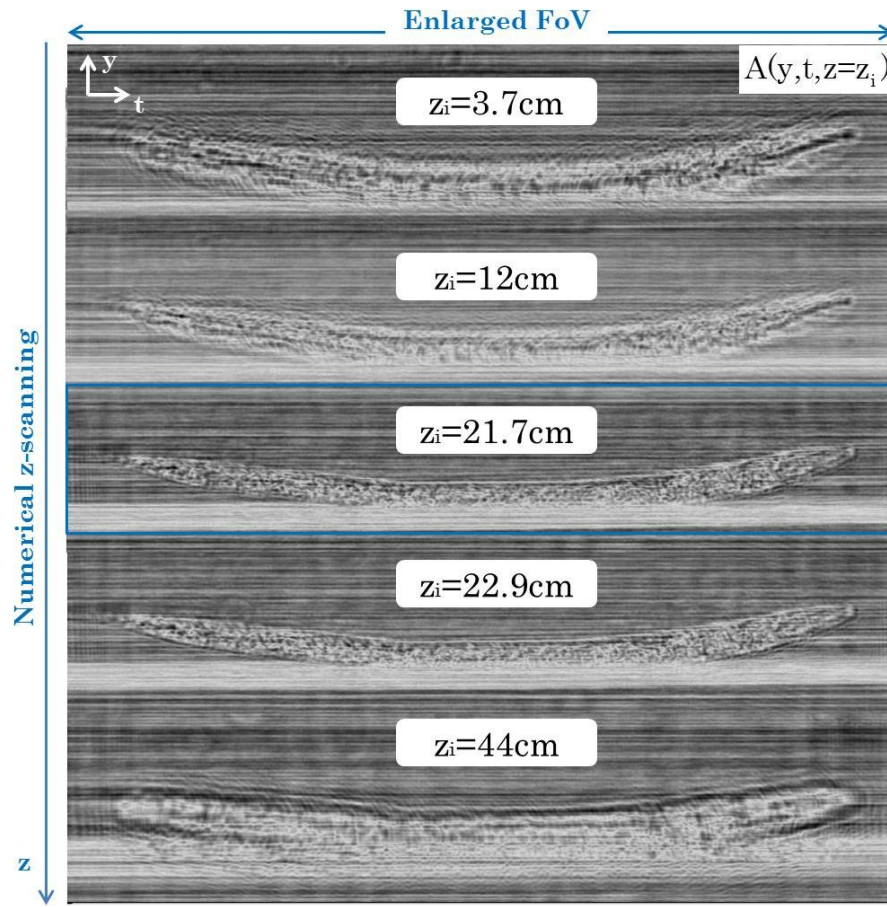


Fig. S3 STDH numerical propagation at various distances starting from out-of-focus recordings. Amplitude images extracted from the z-scanning stack are reported, showing the synthetic hologram refocusing (see Supplementary Movie 3). The blue box indicates the amplitude image at the sample best-focus distance.

Worms preparation: *C. elegans* Bristol strain N2 worms were used. All worms were cultured and handled as described by Brenner [45]. Worms were cultivated at 20°C on NGM agar plates and fed with the *Escherichia coli* strain OP50. To prepare animals for the experiment, we washed with sterilized water a non starved plate with mixed stages of worms, which were anaesthetized with 10 mM Sodium Azide before loading them into the microfluidic device.