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Laser Speckle Contrast Imaging's Sensitivity to Buried Flow ANTHONY YOUNG, Miami Univ — Laser speckle contrast imaging (LSCI) is a flow-imaging technique that uses wide-field, coherent illumination to obtain flow maps of scattering fluids. This technique has a wide range of uses in the biomedical field for studying blood flow in tissue. However, its ability to detect blood flow is limited to that only through superficial vasculature. The objective of this study was to experimentally explore how LSCI's ability to sense flow varied as flow was buried in a scattering medium at depths ranging from 0 mm to 3 mm. The flowing and surrounding media were made of mixtures of dehydrated milk and water to mimic the reduced scattering of blood ($\approx$ 20 cm^{-1}) and tissue ($\approx$ 5 cm^{-1}) respectively. At each depth, speckle images of the phantom were captured with (6 ml/min) and without (0ml/min) directional flow through the phantom. An empirical parameter was calculated at each depth from LSCI flow maps of the speckle images to quantify LSCI's flow sensitivity as a function of buried depth. The results illustrated that LSCI's flow sensitivity exponentially decreased as the flow was buried deeper in an optically scattering medium.

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