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Sensitivity of diffuse correlation spectroscopy to flow in various optical phantoms SARA ZANFARDINO, KARTHIK VISHWANATH, Miami University — Diffuse Correlation Spectroscopy (DCS) is a non-invasive technique that can be used to quantify relative changes in optical properties in a turbid or scattering medium. Due to its flow sensing capabilities, DCS has been implemented in clinical settings to assist in instances such as cancer diagnosis and treatment monitoring, tracking of wound healing, and the study of cerebral responses to various stimuli. The objective of this study was to determine the effect that varying optical properties of four phantom solutions had on the sensitivity of DCS measurements to variations in flow rates. A series of experiments was conducted: first, to determine the optimal depth of our DCS instrumentation by submerging a flow channel in a highly scattering solution and second, to investigate the effects that optical properties have on DCS sensitivity to changes in flow. Four phantom solutions were created with optical absorption and scattering coefficients chosen to mimic those of real tissue. Three volumetric flow rates were studied (0, 3, and 6 mL/min) with a flow channel submersion depth of 0.6 mm. It was determined that varying the optical properties of the solution did have an effect on sensitivity of DCS detection of variations in flow.

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