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Fourier-Domain Biophotoacoustic Sub-surface Depth Selective Amplitude and Phase Imaging of Turbid Phantoms and Biological Tissue¹ SERGEY TELENKOV, Imaging Diagnostic Systems, Inc.

A novel photothermoacoustic imaging modality utilizing a frequency-swept (chirped) intensity-modulated laser source and coherent frequency domain signal processing ("biophotoacoustics") was introduced for non-invasive imaging of biological tissues. The developed frequency-domain imaging system takes advantage of linear frequency modulation waveforms to relate depth of tissue chromophores to the frequency spectrum of the detected acoustic response and of a narrow signal detection bandwidth to improve signal-to-noise ratio (SNR). Application of frequency-domain photothermoacoustic (FD-PTA) imaging was demonstrated using turbid phantoms and ex-vivo specimens of chicken breast with embedded absorbing inclusions simulating tumors.

¹This work was done in collaboration with Andreas Mandelis.