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A SYSTEM FOR THE IMAGING OF TURBID MEDIA

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A system for the imaging of turbid media.

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Biophys J. 1992; 61(2 Pt 2): A446, 2570.

Abstract

Ultra short light pulses can probe biological tissues. Either correlated single photon counting techniques in the time domain or phase resolved methods in the frequency domain can be used to realize the time resolution required to detect a coherent pulse traversing tissue that has inherent high scattering. To collect a spatial array of data, phase resolved methods are the most viable. We have developed a modulated CCD camera system to record the frequency domain information of photons diffusing through turbid media. The camera has a large field of view (up to 4 cm x 3 cm) and can resolve the phase of the diffusion wave to about 1° at every pixel (660 x 480 pixels cover the field of view). Being able to operate at 200 MHz, the camera can provide a time resolution of about 15 ps. Image processing software has been written to acquire the data and display in near real time the phase resolved image. This work is supported by NIH grant PHS-P41-RR03155.