Abstracts

Experimental Study of the Diffraction of Photon Density Waves by an Absorbing Edge in Highly Scattering Media

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Near-infrared imaging of bodily tissues is of prime importance in medicine. This study makes further inroads into the understanding of the physical principles behind the optical processes occurringin these highly scattering media. Using frequency-domain methods, we have studied the diffraction of transmitted intensity-modulated light waves on an absorbing edge which could be carried in position relative to the illumination and detection fiber optics. The medium was highly scattering and had a variable, adjustable absorption. We report the experimental conditions for which the highest spatial resolution is obtained and discuss the influence of the various photon paths. This work was funded by the National Institutes of Health, grant RR03155.

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