

# UC Irvine

## UC Irvine Previously Published Works

### Title

EFFECT OF AN ABSORBING AND OR REFLECTING EDGE ON SINUSOIDALLY INTENSITY-MODULATED LIGHT PROPAGATING THROUGH STRONGLY SCATTERING MEDIA

### Permalink

<https://escholarship.org/uc/item/9548g39p>

### Journal

FASEB JOURNAL, 6(1)

### ISSN

0892-6638

### Authors

FISHKIN, JB  
GRATTON, E

### Publication Date

1992

### Copyright Information

This work is made available under the terms of a Creative Commons Attribution License, available at <https://creativecommons.org/licenses/by/4.0/>

Peer reviewed

Joshua B Fishkin and Enrico Gratton.

**Effect of an absorbing and/or reflecting edge on sinusoidally intensity-modulated light propagating through strongly scattering media.**

36th Annual Meeting of the Biophysical Society, Houston, Texas, 9-13 February 1992.

*Biophys J.* 1992; 61(2 Pt 2): A499, 2587.

**Abstract**

Imaging of tissues using visible or near infrared light is of great interest in medicine. Using frequency domain methods, we have theoretically and experimentally studied the effect of an absorbing and/or reflecting edge on sinusoidally intensity-modulated light propagating through strongly scattering media. The theoretical study is based on the diffusion approximation to the Boltzmann equation and on the solutions to the Helmholtz equation in the two-fold Riemann's space given by H. S. Carslaw. The predictions of the diffusion model are in excellent agreement with data obtained from Monte Carlo simulations and experiments performed on a strongly scattering medium with different degrees of absorption. These studies provide a theoretical basis for the understanding of light propagation in tissues and allow for determination of the conditions for obtaining maximum resolution and penetration. This work was funded by the National Institutes of Health, grant RR03155.