

Abstract Submitted
for the DAMOP10 Meeting of
The American Physical Society

Measurement of the refractive index of highly turbid media
SAMIR BALI, ERIC WILLIAMS, SARABJOT MAKKAR, MIAO DONG, LALIT
BALI, Dept. of Physics, Miami University — We demonstrate a first simultaneous
measurement of the real and imaginary parts of the refractive index of a highly turbid
medium (scattering coefficient $> 200\text{cm}^{-1}$; by comparison, milk's scattering coeffi-
cient in the visible and near-infrared frequencies lies between 40cm^{-1} and 125cm^{-1}
depending on fat content). We achieve this by observing the real-time reflectance
profile of a divergent laser beam made incident on the surface of the turbid medium.
We find that the reflectance data is well described, for the first time without any
empirical fit-parameters, by Fresnel theory that correctly includes the effect on total
internal reflection of angle-dependent penetration into the turbid medium.

Samir Bali
Dept. of Physics, Miami University

Date submitted: 27 Jan 2010

Electronic form version 1.4