Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Spatially resolved absorption spectroscopy of bio - assemblies on a micron scale SILKI ARORA, Department of Physics and College of Optics, University of Central Florida, JENNIFER MAUSER, DEBOPAM CHAKRABARTI, Burnett School of Biomedical Sciences, University of Central Florida, ALFONS SCHULTE, Department of Physics and College of Optics, University of Central Florida — We have developed a novel approach to measure optical absorption spectra with spatial resolution at the micron scale. The setup employs a confocal microscope with a broadband white light excitation beam in transmission geometry. An aperture controls the amount of illuminating light and localizes the area of excitation. The setup is employed to measure the absorption spectrum of single red blood cells ($\sim$ 7 microns diameter) under solution conditions. The spatial resolution in the lateral direction is found to be better than three microns. Through measurements of the transmitted intensity in met- myoglobin and calcein dye nanoliter solutions at fixed path lengths, we establish that the absorbance varies linearly with concentration over the range from 0.1 to 2 mM. Our instrument enables measurements of spatial variations in the optical density of small samples and may find application in monitoring biological assemblies at the single cell level.

Silki Arora
Department of Physics and College of Optics, University of Central Florida

Date submitted: 08 Dec 2010 Electronic form version 1.4