Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

**Light localization properties of biological cells via confocal imaging**[1] PEEYUSH SAHAY, HEMENDRA M. GHIMIRE, HUDA ALMABADI, PRABHAKAR PRADHAN, Univ of Memphis — Detection and characterization of the spatial refractive index fluctuations of very weakly disordered optical dielectric media has ample applications in various fields ranging from soft condensed matter to biological research. We report a study of the submicron scale degree of the structural disorder of heterogeneous weakly disordered optical dielectric media, such as biological cells, by quantifying their submicron scale light-localization properties. Confocal microscopy is used to construct disordered optical lattices of these dielectric media. Light-localization properties are studied by the statistical analysis of the inverse participation ratio (IPR) of the localized eigenfunctions of these optical lattices at the submicron scales. The method is described and its importance is highlighted. As one of the applications, we demonstrate that using this method, different types of normal and cancerous cells can be distinguished by quantifying the structural disorder inside the cells via their confocal micrographs. Other potential applications of the technique to characterize weakly disordered media, as well as biological cells, in particular cancer detection, are also discussed.

[1]NIH and University of Memphis

Peeyush Sahay
Univ of Memphis

Date submitted: 14 Nov 2014 Electronic form version 1.4