

Abstract Submitted
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Mesoscopic light reflection spectroscopy of weakly disordered dielectric media: Nanoscopic to mesoscopic light transport properties of a single biological cell and ultra-early detection of cancer PRABHAKAR PRADHAN, HARIHARAN SUBRAMANIAN, DHWANIL DAMANIA, HEMANT ROY, VADIM BACKMAN, Northwestern University, Evanston, IL 60208 — We have developed a mesoscopic partial wave spectroscopy (PWS) method to measure the nanoscopic light transport properties of weakly disordered dielectric mesoscopic systems such as biological cells. Using mesoscopic theory, we have statistically quantified the light reflection coefficient and its correlation due to nanoscale refractive index fluctuations within a biological cell, and the results are consistent with the prediction of mesoscopic light transport theory. Finally, using these parameters, we have characterized the nanoscale optical disorder strength within the biological cell. Results of precancerous cell studies and cancer detection by the technique will be discussed.

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