

## SIMULATION ANALYSIS OF MANIPULATING LIGHT PROPAGATION THROUGH TURBID MEDIA

Snow H. Tseng, Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan  
stseng@ntu.edu.tw

Liang-Yu Huang, Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan  
Tzu-Hao Kuo, Graduate Institute of Photonics and Optoelectronics, National Taiwan University, Taiwan

We model light propagation through turbid media by employing the pseudospectral time-domain (PSTD) simulation technique. With specific amplitude and phase, light can be manipulated to propagate through turbid media via multiple scattering. By exploiting the flexibility of the PSTD simulation, we analyze factors that contribute to enhancing light penetration. Specific research findings suggest that it is possible to propagate light with specific amplitude/phase. The reported simulation analysis enables quantitative analyses of directing light through turbid media.

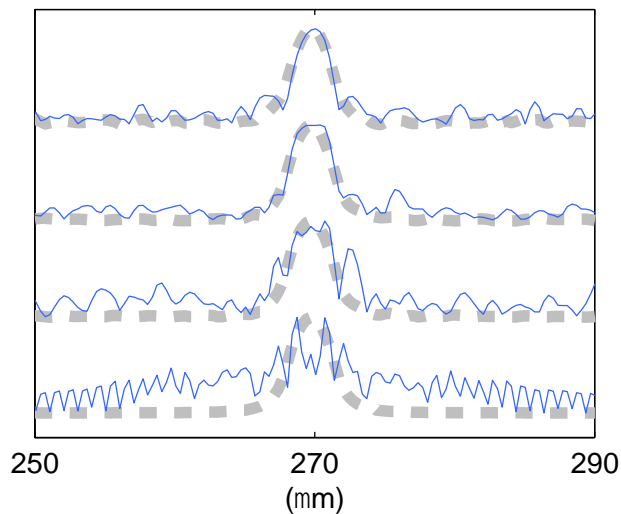


Figure 1. Comparing the transmitted light profile through turbid medium consisting of  $N$  scatterers. (From bottom to top): the turbid medium consists of  $N = 0, 20, 100,$  and  $250$  scatterers, respectively. The transmitted light profile (blue line) is compared to the original source profile (gray dashed line).