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## **Diffuse photon optical tomography: An investigation into the propagation of light through turbid media**

Diffuse Optical Tomography (DOT) provides many promises in the field of Biomedical Imaging because of its advantages over other forms of imaging, such as MRI and CT scans. DOT is very sensitive to tissue, low cost, portable, and safe. Despite this, however, there are some technical problems of using DOT in biomedical imaging. The main problem is quantification of signals related to the probes in the biological tissue. This may be solved by using a newly proposed dual-wavelength technique in the DOT; this technique involves designing multi-detection probes. Another problem is sensitivity of the detection system. Noise is considered to be a limiting factor in the technology, making the sensitivity detection of very weak signals difficult. We will build an initial system for the quantification and sensitivity detections, with the system using two diode lasers in the near-infrared wavelengths where the light photons can penetrate deeper into tissues. Polystyrene beads are used for the simulation of the biological tissues. The propagation of light through a solution containing 1.00 $\mu\text{m}$  polystyrene beads will be investigated for quantification of the signals.