

A Novel Multi-spectral Sensor for Monitoring TSS in Marine Environment

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One of the most important parameters that require in monitoring water quality is turbidity. The aims of this paper are to design and develop multispectral optical sensor for measuring total suspended solids TSS concentrations in marine environment water samples. The developed sensor was based on the transmittance radiation through the suspended particles in water. The developed sensor used three pairs of light-emitting diodes LED's, as sources and three pairs of silicon photodiodes as detectors. The multispectral optical sensor has been designed for measuring the transmitted radiation at 180° between the sources and detectors. The radiation was measured in terms of the output voltage of the photodetectors of the multispectral sensor system. An algorithm was developed to correlate the TSS with the photodetectors voltages. Then TSS concentration is measured using the calibrated algorithm. The developed algorithm produced a high degree of accuracy as indicated by high correlation coefficient and low root mean square error values.