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Multi-spectral Optical Sensor for Air Pollution Monitoring

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Total suspended particulates, TSP monitoring is used to determine the total amount of suspended particulates material present in the atmosphere. The aims of this study are to design and develop an optical sensor for measuring total suspended particulates concentrations in polluted air samples. The developed sensor was based on the light transmittance through the suspended particles in air. In this study, light emitting diodes, LED's were used as light sources and a silicon photodiode as detector. The algorithm has been developed to correlate the total suspended particulates concentrations with the transmitted light. The spectral optical sensor has been designed for measuring the transmitted radiation at 180° between the source and detector. The radiation was measured in terms of the output voltage of the photodetector of the sensor system. The correlation coefficient (R^2) produced was high and the root mean square error (RMSE) was low value.