Development of Particle Distribution Estimation (PDE) Model Based on Particulate Mass Concentration for Indoor Ambient Air Monitoring

ABSTRACT

Particulate Matter (PM) mass concentration is one of the key elements in determining Air Quality Index (AQI). Conventionally, PM mass concentration is measured using Federal Reference Method (FRM) which apply the filter based gravimetric method. While the mass concentration may be used as a threshold limit on particulate matter exposure, recent studies had shown that particles distribution may provide better insight on the adverse effect of particulate matter exposure. In this study a Particle Distribution Estimation Model (PDE) was developed for determination of particle distribution based on particulate mass concentration. The model was developed using correlation between Particle distribution and particulate mass concentration from purple Air-II (PA-II) an optical based research grade instrument. The Particle Distribution Estimation (PDE) Model was evaluated at an outdoor environment. The estimated particle distribution from the PDE shows excellent correlation with the actual particle distribution from the reference instrument with R^2 is higher than 0.8.