

A Continuous Ambient Mass Monitoring System (CAMMS) for PM2.5 Mass

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The system is based on the increasing pressure drop of a filter by as it loads with particulate. A constant air flow through a filter generates an increasing pressure drop over the filter, when dust deposits on the filter material. This pressure drop does not only depend on the mass concentration, it also varies with the particle diameter. It is very sensitive to small particles, but not to big particles. The CAMMS has two Virtual Impactor stages that take out a given percentage of the fine dust amount, so that the sensitivity becomes independent of the particle size and linear to the mass concentration. A reference path cancels out temperature, humidity and other effects. CAMMS is ideal for measuring volatile particles because no heating is required (a permeation dryer keeps $R_h < 40\%$). An automatic filter transport system ensures continuous dust measurement and avoids losses caused by changes in sampling equilibrium. Measurements showing the performance of the system and comparing it to other methods will be shown.