



## **Characterizations of particle size distribution in Guangzhou during dry season**

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The relationship of ambient aerosol and visibility deterioration over Pearl River Delta (PRD) have attracted more and more attentions in recent years. The extinction coefficient of ambient aerosol can be calculated with the Mie theory (N. Ma, 2014), which is based on a set of measured dry aerosol number size distribution, ambient relative humidity, aerosol hygroscopic growth factor, and the assumption of no activation. Using the parameters that can be easily measured would make the extinction coefficient of ambient aerosol calculation more widely available.  $PM_{2.5}$  (total mass concentration of dry aerosols with the aerodynamic diameter smaller than  $2.5\mu m$ ) measurements are widely applied in PRD, the aerosol concentrations could be estimated based on  $PM_{2.5}$  measurements and used to calculate the extinction. However, with different size distributions, aerosol with the same mass concentration may have different extinction coefficients. Ignoring the variations of the shapes of aerosol size distributions may introduce an uncertainty in the calculation of aerosol extinction coefficient. In order to quantify this uncertainty, the historical data of aerosol size distribution need to be analyzed. In this paper, continuous measurements of particle number size distributions and  $PM_{2.5}$  were simultaneously performed at Guangzhou urban site from Nov. 2014 to Jan. 2015. The temporal and diurnal statistical results of dry seasons would be used in the calculation of aerosol extinction coefficient, and the extinction coefficients corresponding to a certain aerosol volume concentration and relative humidity are given in the form of probability distribution.