



## **Estimation of surface-level PM concentration based on aerosol type classification and near-surface AOD over Korea**

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Surface-level PM distribution was estimated from the satellite aerosol optical depth (AOD) products, taking the account of aerosol type classification and near-surface AOD over Jeju, Korea. For this purpose, data from various instruments such as satellites, sunphotometer, and Micro-pulse Lidar (MPL) was used during March 2008 and October 2009. Initial analyses of comparison with sunphotometer AOD and PM concentration showed some relatively poor relationship over Jeju, Korea. Since the AERONET L2 data has significant number of observations with high AOT values paired to low surface-level PM values, which were believed to be the effect of long-range transport aerosols like as Asian dust and biomass burning. Stronger correlations (exceeding  $R = 0.8$ ) were obtained by screening long-range transport aerosols and calculating near-surface AOT considering aerosol profiles data from MPL and HYSPLIT air mass trajectory. The relationship found between corrected satellite observed AOD and surface-level PM concentration over Jeju is very similar. An approach to reduce the discrepancy between satellite observed AOD and PM concentration is demonstrated by tuning thresholds used to detect aerosol type from sunphotometer inversion data. Finally, the satellite observed AOD-surface PM concentration correlation is significantly improved. Our study clearly demonstrates that satellite observed AOD is a good surrogate for monitoring PM air quality over Korea.