



Aerosol extinction profile mapping with lognormal distribution function in Taiwan

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Satellite remote sensing can provide the total column aerosol information in a better spatial resolution than ground-based measurement, but the information near surface layer is still restrictive by the vertical distribution of aerosols. Therefore, this study aims at mapping aerosol extinction profile in terms of lognormal distribution which equips similar pattern to aerosol vertical distribution with single-peak conditions. The two variables of lognormal distribution, log mean (μ) and log standard deviation (σ), could be correlated with Aerosol Optical Depth (AOD) in total column and meteorological parameter of Planetary Boundary Layer Height (PBLH). Based on ten-years dataset from Micro Pulse Lidar (MPL) measurements, regression analysis has been used to construct the relationship between meteorological data (AOD and PBLH) and lognormal variables (μ and σ). Then the proposed method was further applied to MODIS AOD and GMAO PBLH products in mapping extinction profile around Taiwan island for the spatial distribution of particulate matters (PM) concentration near surface layer. The results are quite consistent with the point measurements from PM stations indicated high feasibility of proposed method in mapping the vertical distribution of aerosols.