

Long-term monitoring of aerosol optical properties

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We investigated the long-term monitoring of aerosol and cloud optical properties at ground-based and maritime measurements since 1990's by the Sky radiometer (POM-01, 02: PREDE Co. Ltd., Tokyo, Japan. Nakajima et al., 2020 [1]). Our objectives were to understand the effect on earth climate change of aerosols, and the other was to validate satellite (e.g., GCOM-C/SGLI and Himawari, JAXA) and numerical models (e.g., SPRINTRAS). Solar aureole measurements have been employed for aerosol optical properties (Aerosol optical thickness and Single scattering albedo at each wavelength, Ångström exponent, etc.), size distribution of volume and so on. These data have revealed various events for anthropogenic and/or natural aerosols, seasonal and long-term trends. However, there are still some things to consider in different observation environments and different climatic conditions, such as changes in some atmospheric conditions and parameters, which are also related to spatial and temporal variability. Based on the validation of satellite and numerical model, we are conducting different research (relation between atmosphere, Ocean, Cryosphere, and Land) to proposals for next validation and analysis, focusing on the wavelength dependence of optical properties. We provide the possibility to the comparison of remote sensing and model, in this presentation, on the aerosol optical properties measurements with temporal and spatial variability in the long-term monitoring.

Keywords: remote sensing, aerosol and clouds

References

[1] Nakajima et al., Atmos. Meas. Tech., 13, 4195–4218, 2020, <https://doi.org/10.5194/amt-13-4195-2020>.