

# Optical properties of aerosols determined from shipboard sky radiometry observation

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We investigated the solar radiation observed with a sky radiometer onboard the Antarctic Research Vessel *Shirase* from 2000 to 2006. The data were analyzed using SKYRAD.pack ver. 4.2 (Nakajima et al. 1996) and the optical properties of marine aerosols were retrieved between Japan and Australia. The optical properties are single scattering albedo at 500 nm SSA, Ångström exponent  $\alpha$ , and aerosol optical thickness at 500 nm AOT, which indicates light-absorptivity, particle size, and aerosol loading, respectively. We further made strict data quality check on the radiometric calibration and ship movements. As a result, we obtained 28 events around Indonesia (1), around eastern Australia (10), and over the western Pacific Ocean (17). We discussed the optical properties of aerosols over the western Pacific Ocean in detail because we usually go through air pollution from East Asia in spring. During 9-10 April, 2005, SSA ranged from 0.82 to 0.96, indicating from light-absorptivity to non-light-absorptivity.  $\alpha$  was more than 1.0, suggesting that fine particles dominated. AOT was high (0.64-0.81) even over the open ocean, therefore aerosol loading was high. To investigate air mass paths at analyzed sites for 1000 m above ground level, 5-day backward trajectories were calculated using HYbrid Single Particle Lagrangian Integrated Trajectory (HYSPLIT; Draxler and Rolph 2015). It was found that the air mass came from the Chinese continent and then passed over urban area of Japan, so that anthropogenic aerosols had influence on optical properties. We will compare the shipboard observation with satellite to investigate characteristics of aerosols over the ocean.

Key words: aerosol, sky radiometry, shipboard measurement

## References

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