

The retrieval results of aerosol optical thickness from POLDER-I/ POLDER image data sets over the land area in Mongolia using the information of reflectance and polarization

Y. Kawata , N. Maeda, M. Abe

Kanazawa Institute of Technology, Japan, (kawata@infor.kanazawa-it.ac.jp / Fax: +81 76-274-7733 / Phone:+81-76-274-7096)

Aerosol optical thickness (AOT) values in the near infrared channels at 670nm and 865nm were retrieved from ADEOS-I/ POLDER images over the land area in Mongolia by using a directional reflectance- polarized radiance algorithm. This retrieval algorithm was previously applied for POLDER ocean image data [Kawata, Y., Izumiya, T., and Yamazaki, A., 1999, Retrieval algorithm for aerosol optical parameters from POLDER's directional reflectance and polarization data, Proc. of SPIE, vol. 3759, pp.40-48.]. The validation of the retrieved results was made by comparing with the sky observation data at Dalanzatgad, Mongolia, one of AERONET sites operated by NASA.. In the retrieval study we analyzed several aerosol size distribution models using 8 POLDER image data sets containing Dalanzatgat site in their scenes, dated from April to May, 1997. We found that the correlation coefficients between the retrieved and measured AOT values were very good ($R=0.83$ at 670nm and $R=0.79$ at 865nm) when assuming a log-normal distribution model with ($r=3.55$ and $\sigma=0.358$), where r and σ are the mode radius and standard deviation. This suggested that large size aerosol particles dominate there at that time.. In the computation we fixed the complex refractive index of aerosol particles, $m=1.46 -i0.006$ which was taken from the measured data at Dalanzatgat. However, a poor correlation coefficient was obtained in the case of Angstrom exponent, which was extrapolated from retrieved aerosol optical thickness values at 670nm and 865nm. Some discussions for retrieving reliable Angstrom exponent were given.