AOGS 2005
©2005 Asia Oceania Geosciences Society, Singapore

Atmosphere optical thickness monitoring using Landsat TM images

H. S. LIM, M. Z. MATJAFRI and K. ABDULLAH

School of Physics, Universiti Sains Malaysia, 11800 Penang, Malaysia
Tel: +604-6533888, Fax: +604-6579150

E-mail: mjafri@usm.my, khirudd@usm.my

Atmospheric aerosol distribution is retrieve from Landsat TM image using a developed algorithm for Penang Island, Malaysia. In this study, we present a three visible channel aerosol retrieval algorithm. The in situ measurement of atmospheric transmittance data were collected using a handheld spectroradiometer taken simultaneously with acquired remotely sensed satellite data. The atmospheric optical thicknesses (AOT) were calculated using the Beer-Lambert-Bouguer law from the atmospheric transmittance measurements. The digital numbers for the three visible bands corresponding to the in situ locations were extracted and then converted into reflectance values. The reflectance measured from the satellite was subtracted by the amount given by the surface reflectance to obtain the atmospheric reflectance. These atmospheric reflectance values were used for calibration the AOT algorithm. The efficiency of the present algorithm, in comparison to other forms of algorithm, was also investigated. The proposed algorithm can estimate AOT distribution with high linear correlation coefficient. The calibrated algorithm was used to generate the AOT map over Penang Island, Malaysia. The air quality map was geometrically corrected. Finally, the created AOT map was filtered to remove noise and colour-coded for visual interpretation.

Keywords: AOT; spectroradiometer; sky transmittance

References

[1] P. Camagni and S. Sandroni, *Joint Research Centre, Ispra, Italy, Elsevier Science Publishing Company Inc*, (1983).

[2] H. Fukushima, M. Toratani, S. Yamamiya and Y. Mitomi, *Adv. Space Res*, 25(5), (2000).