AOGS 2005

Ground-based UVB Spectral Measurements of Australian Aerosols

FRANKLIN P. MILLS[1,2], OLGA KALASHNIKOVA[3], ANNMARIE ELDERING[3], DON ANDERSON[4] and ROSS MITCHELL[5]

1 Centre for Resource and Environmental Studies, The Australian National University, Canberra
2 Research School of Physical Sciences and Engineering, ANU, Canberra
3 Jet Propulsion Laboratory, California Institute of Technology, Pasadena
4 Bureau of Meteorology, Melbourne
5 CSIRO Atmospheric Research, Earth Observation Centre, Canberra

An understanding of the effect that aerosols have on the biologically and photochemically-active UV radiation reaching the Earth's surface is important for many ongoing climate, biophysical, and air pollution studies. In particular, estimates of the UV characteristics of the most common Australian aerosols will be valuable inputs to UV Index forecasts, air quality studies, and assessments of the impact of regional environmental changes. Two Australian sites with collocated ground-based UVB spectrometers and ozone column measurements operated by the Australian Commonwealth Bureau of Meteorology are Darwin and Alice Springs. Each has had episodes of moderate to high aerosol optical depth in 2003 and 2004 with aerosol optical depths as high as about 0.6 over Darwin in October to November 2004 due to smoke from biomass burning. Over Alice Springs, the periods of high aerosol optical depth are typically due to airborne dust lofted from arid regions in the center of the continent. Using the ozone column measurements to correct for variations in the overhead ozone column, UVB spectra from clear days will be compared with those from days with high aerosol opacity to identify the influence of dust and smoke on the spectral distribution of the UVB radiation reaching the surface.

Keywords: aerosol; Australia; Darwin; Alice Springs; smoke; dust; UVB radiation; UVB spectra; biomass burning