

Measurement of Radiative Properties of atmospheric aerosols using global data from ATSR.

R.M.Dundas, D.T. Llewellyn-Jones.
University of Leicester.

C.T.Mutlow A.M. Zavody and P. Watts.
Rutherford Appleton Laboratory.

Department of Physics and Astronomy,
University of Leicester
University Road, Leicester
United Kingdom LE1 7RH
Tel: +44 116 2525264
Fax: +44 116 2525262
E-mail: rowan@atsrsc.rl.ac.uk

This paper will present the results of an investigation into the relationship between sea surface temperature (SST) and aerosol contamination. Both stratospheric and tropospheric aerosol concentrations change the normal spectral absorption characteristics of the atmosphere by increasing the infrared attenuation signal to the satellite, so satellite SST retrievals in aerosol contaminated regions are biased low. An analysis of ATSR SST data show the importance of this instrument in understanding the effects of aerosols upon SST.

In June 1991, Mount Pinatubo in the Philippines erupted several times. These eruptions provided a situation in which to investigate the use of ATSR data to analyse heavy stratospheric aerosol concentrations. Using a relationship between the SST derived from ATSR's dual view and single view, a gradual global dispersal of the Pinatubo aerosol cloud was found. The movement of tropospheric aerosol from the Sahara can also be clearly seen with a gradual build up of aerosol peaking in July, which is consistent with other observations of Sahara dust.

>From both brightness temperatures (BT) data and modelled BTs, the radiative properties of the aerosols on the data can be quantified and hence related to concentration with further modelling of the particles resulting in other aerosol properties. Furthermore it is possible to obtain more accurate SST retrieval coefficients that allow for the effects of aerosol.

Keywords: ESA European Space Agency - Agence spatiale europeenne, observation de la terre, earth observation, satellite remote sensing, teledetection, geophysique, altimetrie, radar, chimique atmospherique, geophysics, altimetry, radar, atmospheric chemistry