Geophysical Research Abstracts, Vol. 9, 09506, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-09506

Influence of aerosols on deep convection

P. Connolly (1), P. T. May (2), G. Vaughan (1), G. Allen (1)

(1) University of Manchester, UK, (2) Bureau of Meteorology, Melbourne, Australia

(p.connolly@manchester.ac.uk)

Darwin and the surrounding areas sample strongly forced diurnal convective storms in the non-monsoon periods of the wet season. In particular, a set of thunderstorms form almost every day on the islands just to the north of Darwin. The aerosol loading in the boundary layer is high during the early part of the season because of biomass burning, but decreases to very low levels at the end. This offers the possibility of using seasonal differences in the thunderstorm properties to investigate the influence of aerosol on deep convection. During the 2005 and 2006 intensive observing periods of the ACTIVE (Aerosol and Chemical Transport In tropical conVEction) and ARM/Bureau of Meteorology TWPICE experiments, the UK Dornier aircraft was making detailed aerosol observations. These are used to define aerosol regimes and to estimate the amount of aerosol available as condensation nuclei. These observations are compared with with radar and satellite derived products describing active convective areas, cloud areas, and differences in microphysical structure for the cloud systems.

High-resolution modeling of the storm systems revels a complex interplay between aerosol and thermodynamic conditions in determining the properties of the storm anvils. Models and measurements will be used together to examine the factors that influence the amount of ice detrained in the anvils.