Geophysical Research Abstracts, Vol. 9, 10006, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-10006

A climatological evolution of ozone as expressed by ozonesonde measurements collected throughout the ACTIVE campaign

W. Heyes (1), G. Vaughan (1), G. Allen (1)
(1) Centre for Atmospheric Science, University of Manchester

The Aerosol and Chemical Transport in tropIcal conVEction (ACTIVE) aircraft campaign was conducted from Darwin, Australia, in two phases between November-December 2005, and January-February 2006. The first period investigated pre-monsoonal deep convection systems, such as those observed consistently over the nearby Tiwi Islands. The second period was characterised initially by widespread monsoonal convection and a subsequent monsoon-break period during which localised storm systems again dominated. Aircraft and ozonesonde field measurements were recorded throughout the entire campaign, in conjunction with two other international field projects -SCOUT-O3 during the first period, and TWP-ICE during the second. This paper focuses on tropospheric ozone profiles recorded by ozonesondes during ACTIVE. The background tropospheric ozone profile shows a large degree of variability dependent on the evolving local meteorology, with four main phases identified: a biomass-burning phase in November - displaying a relatively polluted background ozone profile with a high degree of variability within both the troposphere and the tropical tropopause layer (TTL); a second phase consisting of profiles collected in the December pre-monsoon period, where cleaner ozone profiles relative to the burning phase are observed that display a high degree of consistency through the troposphere, yet exhibiting high variance within the TTL; a third phase, containing profiles from the January monsoon period, shows exceptionally clean and consistent tropospheric ozone profiles, however continuing to show large variations within the TTL; and a fourth phase during monsoonal-break conditions in February, showing a return to more pre-monsoon concentrations, but with increased variability in the free troposphere and greater consistency around the TTL. This climatology is a valuable dataset of tropical tropospheric ozone profiles providing evidence for typical regional

ozone concentrations under a range of meteorological conditions.