



The SCOUT-O3 Tropical Aircraft Campaign Darwin 2005 — an overview

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The SCOUT-O3 Tropical Aircraft Campaign took place in November-December 2005 and comprised two major components: 12 survey flights between Europe and Australia, and 9 local sorties from Darwin. The survey flights were carried out by the DLR Falcon, the M-55 Geophysica, and a Swiss Learjet. The payloads on the survey flights included some in-situ measurements in the upper troposphere and lower stratosphere (UTLS), but focused on remote sensing of the UTLS by lidar, H₂O DIAL, and emission spectroscopy of the limb or zenith atmosphere. One local sortie was also focused on remote sensing; the others focused on in-situ probing of the tropical tropopause layer (TTL). The campaign was sited in Darwin to investigate “Hector”, a large, isolated, thunderstorm that forms almost daily on islands near Darwin in the pre-monsoon period. Local flights were performed by the Falcon and the Geophysica, often in collaboration with the UK NERC Dornier 228 and the ARA Egrett, which were studying the transport and microphysics associated with Hector as part of the NERC ACTIVE programme. Support with forecasting and now-casting during the local sorties was provided by the Australian Bureau of Meteorology (BoM), and sorties were often guided in real-time by a team from SCOUT-O3/ACTIVE/BoM, in the Bureau, using radar and satellite products. This allowed, for example, coordinated sampling of the storm high towers by the Geophysica, the higher parts of the storm anvil outflow by the Egrett, the lower parts of the storm anvil outflow by the Falcon, and the storm inflow by the Dornier. Data from these Hector sorties will be used to investigate direct injection of material into the lower stratosphere by convection, and modification of the TTL by the anvil. Other local sorties covered a wider geographical

area, and will be used to investigate the mean state of (and variability within) the TTL far from convection.