



## **The role of peroxyacetyl nitrate (PAN) in North Atlantic intercontinental transport events**

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Mid-North Atlantic peroxyacetyl nitrate (PAN) measurements, taken onboard the new UK FAAM BA146 research aircraft during the recent Intercontinental Transport of Ozone and Precursors (ITOP) campaign using a dual channel gas chromatograph with electron capture detection (GC-ECD) with a time resolution of 90 s and detection limit of 5 pptV, are presented. Intercontinental transport (ICT) of North American air-masses from a variety of regions ranging from New York to Alaska was captured over the Azores domain during the 2004 summer campaign.

The role of PAN in long-range transport events was demonstrated during the intercept of an Alaskan biomass plume at an altitude of 5.6 km (asl) on 20/07/04. During the flight, PAN mixing ratios topped 4 ppbV and correlated well with CO, which reached 593 ppbV. In contrast, ozone and NO levels within the biomass air remained relatively low, at ~80 ppbV and 70 pptV respectively, similar to levels measured outside the plume region. PAN accounted for 39 % of all odd nitrogen species ( $\text{NO}_y$ ) measured within the plume in total, and, hence, seemed to be acting as a significant  $\text{NO}_x$  sink, prohibiting ozone production.

Preliminary results from a zero-dimensional box model, incorporating a near-explicit chemical degradation mechanism taken from the Master Chemical Mechanism (MCMv3.1, <http://mcm.leeds.ac.uk/MCM>) and initialised with upwind measurements from this Alaskan biomass plume, support the observations presented and demonstrate

the strong relationship between PAN,  $\text{NO}_x$  and ozone as well as the importance of key hydrocarbon precursors within such plumes.