

North Atlantic Long-Range Transport Research at Pico Mountain, Azores, Portugal

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An atmospheric research observatory was established on top of Pico Mountain, Azores, 2001 (Figure 1). Measurements of CO, O₃, NO, NO₂, NO_y, and black carbon have been ongoing. The site is located at an elevation of 2225 m on the slope of an inactive volcano and well above the marine boundary layer. Free tropospheric air is frequently encountered. Available data demonstrate transport events from North America as well as a plethora of situations that can be deemed representative for North Atlantic background air.

During spring 2004 an automated gas chromatograph system was added for measurements of long-lived C₂-C₇ hydrocarbons. Because of differences in their OH reaction rate constants, atmospheric mixing ratios of hydrocarbons diminish at different rates during their transport from emission regions to remote receptor sites. Consequently, the monitoring of hydrocarbon ratios will be used as a powerful tool for analysis of atmospheric transport over long distances as well as for differentiating air that has been influenced by local emissions from the island.

The hydrocarbon monitor was tailored towards the measurement challenges at this remote and high-altitude site. Particular features include low power consumption, automated shut down and power-up procedures, on-site preparation of consumable gases, fully automated and remotely controllable operation and calibration, ftp data transfer, and cryogen-free sample focusing and analysis procedures for ppt-level detection of hydrocarbon compounds. Measurements are anticipated to begin in May 2004 and will continue during the summer of 2004 and during ITCT2K4.



Figure 1. View of the International Chemical Observatory (ICO) on the saddle of Pico Mountain.