Geophysical Research Abstracts
Vol. 13, EGU2011-5864, 2011
EGU General Assembly 2011


# Studies of long range transport of halogenated substances in South America and South East Asia.

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We present two studies concerning the long range transport of substances important for stratospheric ozone loss and tropospheric halogen loading. Our studies are performed using the UK Met Office atmospheric dispersion model NAME III. This is a Lagrangian particle dispersion model that includes modules for; radioactive decay; non-linear chemistry; puff-plume modelling.

In the first case study we have analysed several years of measurements of CH3Cl made at the Ragged Point research station, Barbados. These data suggest that there are consistent seasonal anomalies in the annual cycle of CH3Cl. We have used NAME air history analysis to show that when observed CH3Cl is above the statistical baseline, the sampled air originated from regions of the South American continent where thermal anomalies (detected by the NASA MODIS instrument) suggest recent biomass burning activity. By performing runs initialised at the thermal anomalies we show that biomass burning does likely contribute to the enhancements of CH3Cl seen at Barbados; however, analysis of ratios between enhancements of CH3Cl and NMHCs suggest that the enhanced CH3Cl also has a biogenic origin, most likely via production from tropical vegetation.

The second case study examines measurements of the anthropogenic tracer C2Cl4 made during two Boreal winters in Malaysian Borneo. Meteorological analyses suggest that the Northeast monsoon, and in particular 'cold surges' forced by Southeasterly movements of the Siberian High, cause much of the observed variability in our C2Cl4 measurements. For example, drops in surface temperature over the Philippines are typically followed (after 2-3 days) by increases in C2Cl4 in Borneo. NAME air history analyses are then used to confirm that 'cold surges' cause rapid transport of Northern mid-latitude pollution to the tropical Maritime Continent.