NAME modelling activities for ATTREX-CONTRAST VSLS measurements

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The work presented shows the analysis of the Numerical Atmospheric dispersion Modelling Environment (NAME model) runs made from the ATTREX-2 flight campaign over the East Pacific in January-February, 2013, and the ATTREX-3 and CONTRAST flight tracks over the West Pacific in January-March, 2014. For each flight, particles (15,000 per single point along the flight track where Advanced Whole Air Samplers took measurements) are released from the flight altitude tracks and followed 12 days backwards to identify the origin, location and timescales of the airmass reaching the Tropical Tropopause Layer (TTL). Cases presented are for flights with evident high and low degree of convective influence. Fractions of trajectories are calculated according to particles which crossed certain levels in the low troposphere such as 5 and 1 km. Then, initial concentrations for Very Short Lived Species (VSLS), in particular bromoform, methyl iodide and dibromomethane are assigned, based on (i) AWAS ATTREX/CONTRAST observations and (ii) WMO (2010) boundary layer concentrations - to particles which originated from below 5/1 km. The contributions of low altitude airmasses to the high altitude samples can then be estimated. These NAME modeled results are then compared with ATTREX VSLS flight measurements. Flights from the ATTREX-2 and ATTREX-3 are used to assess the spatial and temporal variability within the vertical transport in deep convection which is one of the crucial factors in redistributing chemicals within the Pacific tropical troposphere.

References (if needed)

ASHFOLD, M. J., HARRIS, N. R. P., ATLAS, E. L., MANNING,A. J. and PYLE, J. A.. Transport of short-lived species into the Tropical Tropopause Layer Atmospheric Chemistry And Physics. 2012,12(14), 6309-6322