

## ***Interactive comment on “Air mass origins influencing TTL chemical composition over West Africa during 2006 summer monsoon” by K. S. Law et al.***

**Anonymous Referee #1**

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REVIEW OF LAW ET AL: AIR MASS ORIGINS INFLUENCING TTL CHEMICAL COMPOSITION OVER WEST AFRICA DURING 2006 SUMMER MONSOON

Overall Synopsis and Summary -

Air mass origins over west Africa in the upper troposphere, TTL (tropical tropopause layer) and lower stratosphere are examined using satellite data, back trajectories and measurements from the M55 (Geophysica aircraft) that sampled water vapor, particle concentrations and constituent abundances (ozone, CO, NO, Noy, etc). Flows are complex in several ways. As expected, overall flows are westerly, but influences are local over west Africa, from lower and mid-troposphere, and flows from the Asian mon-

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soon are appreciable. Cross-hemispheric influences are also detected. Ratios of these various influences are determined and ozone photochemical rates are supplied.

Recommendation - Publish with minor changes as suggested.

Page 3, Line 23... after lightning NO<sub>x</sub> (add refs Pickering et al., 1996; Thompson et al., 1996)

Pickering, K. E., A. M. Thompson, D. P. McNamara, M. R. Schoeberl, H. E. Fuelberg, R. O. Loring, Jr., M. V. Watson, K. Fakhruzzaman, and A. S. Bachmeier, TRACE-A trajectory intercomparison: 1. Effects of different input analyses, *J. Geophys. Res.*, 101, 23,909-23,925, 1996. Thompson, A. M., K. E. Pickering, D. P. McNamara, M. R. Schoeberl, R. D. Hudson, J. H. Kim, E. V. Browell, V. W. J. H. Kirchhoff, D. Nganga, Where did tropospheric ozone over southern Africa and the tropical Atlantic come from in October 1992? Insights from TOMS, GTE/TRACE-A and SAFARI-92, *J. Geophys. Res.*, 101, 24,251-24,278, 1996. »»»»»»»»». Page 4, Line 9. Note the TC4 and TCSP campaigns over central America in 2007 and 2005, respectively. Goals are similar to AMMA and sampling by WB-57 and DC-8 covered some of the same region. Soundings also encompassed TTL. Refer to papers in press:

Selkirk, H. B., H. Vömel, J. M. Valverde Canossa, L. Pfister, J. A. Diaz, W. Fernández, J. Amador, W. Stolz, and G. Peng, The detailed structure of the tropical upper troposphere and lower stratosphere as revealed by balloonsonde observations of water vapor, ozone, temperature and winds during the NASA TCSP and TC4 Campaigns, *J. Geophys. Res.*, in press. Get from papers in press. Thompson, A.M., A. M. MacFarlane, G. A. Morris, J. E. Yorks, S. K. Miller, B. F. Taubman, G. Verver, H. Vömel, M. A. Avery, J. W. Hair, G. S. Diskin, E. V. Browell, J. M. Valverde-Canossa, T. L. Kucsera, C. A. Klich, D. L. Hlavka, Convective and wave signatures in ozone profiles over the equatorial Americas: Views from TC4 (2007) and SHADOZ, *J. Geophys. Res.*, doi: 10.1029/2009JD012909, in press, 2010. - Get from papers in press. Toon, O. B., et al. (2010), Planning and implementation of the Tropical Composition, Cloud and Climate

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