

# Supplement to Interactive Discussion of Manuscript ACP-2009-511

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## 1 Comparison of ozone sonde measurements with modeled profiles

The following figures (Fig. 1, 2, 3) show averaged ozone profiles of different SHADOZ sites from 2004 compared with the corresponding model output. There is in general good agreement between the model and the observations, though the five stations in South America, Atlantic and Africa show higher ozone concentrations at lower altitudes than the model. This is very likely the consequence of our assumption that the detrainment mixing ratio is zonally uniformly distributed. In contrast, Thompson et al. (2003) show that there are notable zonal variations of ozone abundance in the lower troposphere with significantly higher concentrations in the aforementioned areas.

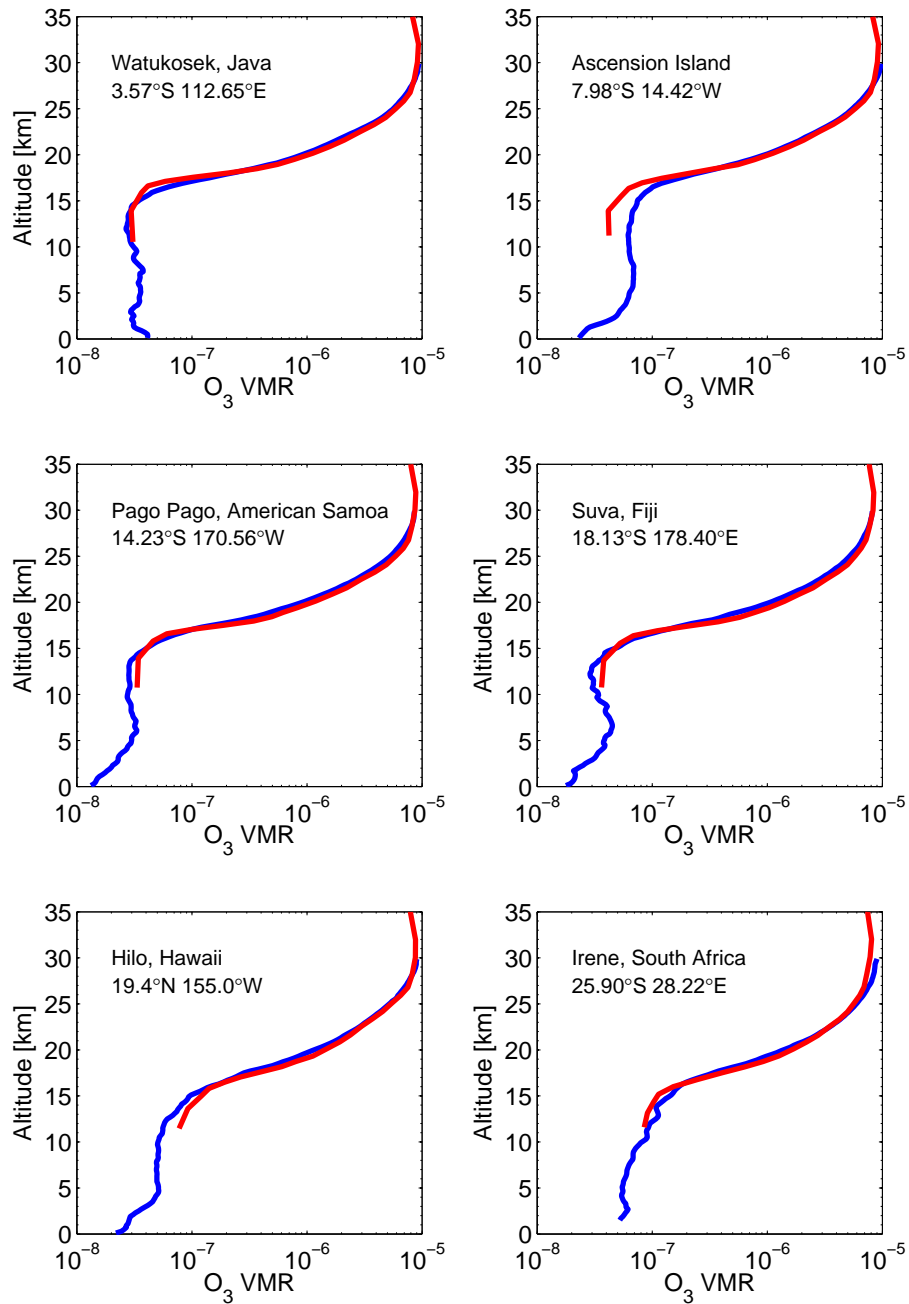


Figure 1: Comparison of modeled ozone (red) and SHADOZ measurements (blue) at different locations. The profiles are a yearly average of 2004.

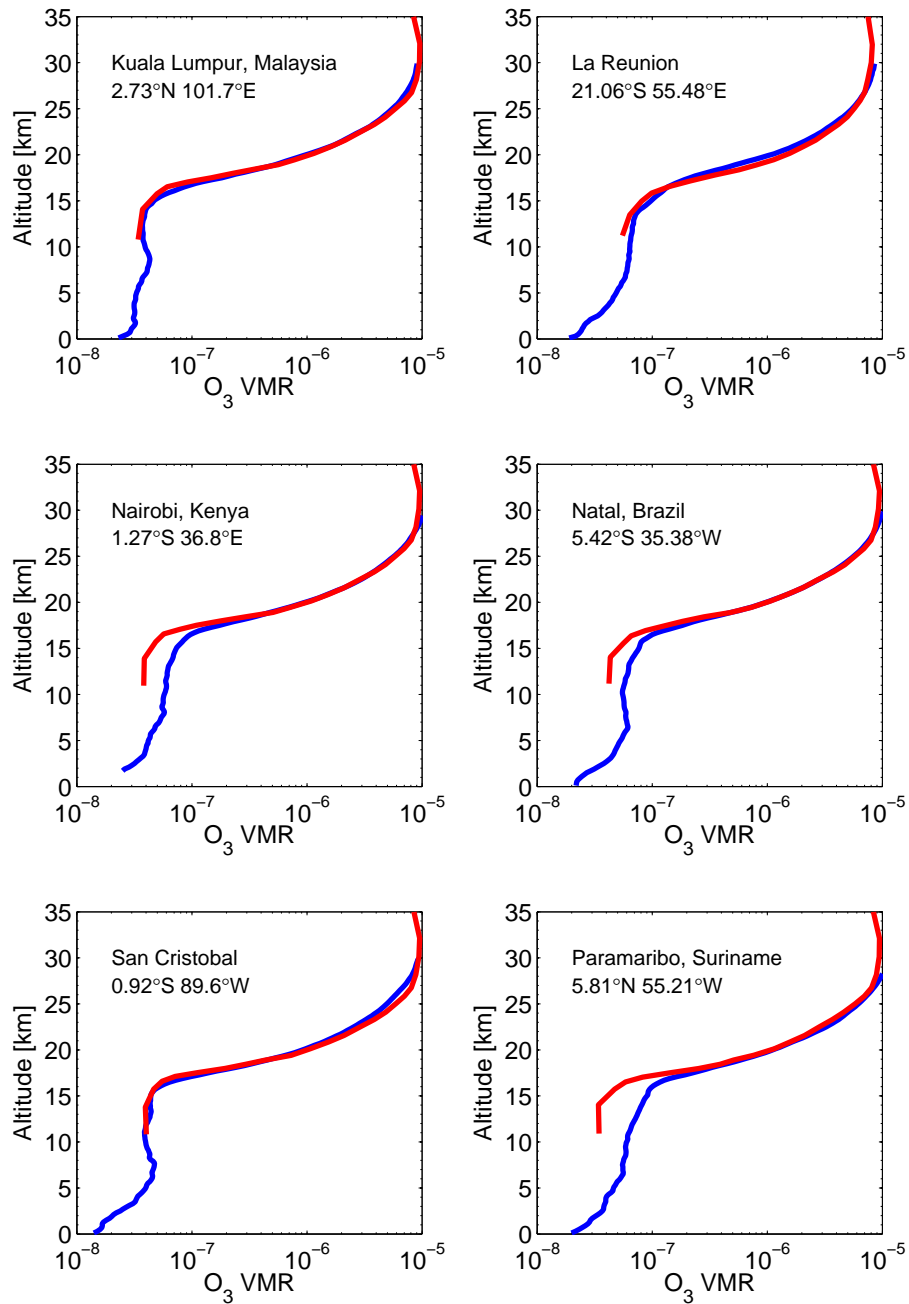


Figure 2: Comparison of modeled ozone (red) and SHADOZ measurements (blue) at different locations. The profiles are a yearly average of 2004.

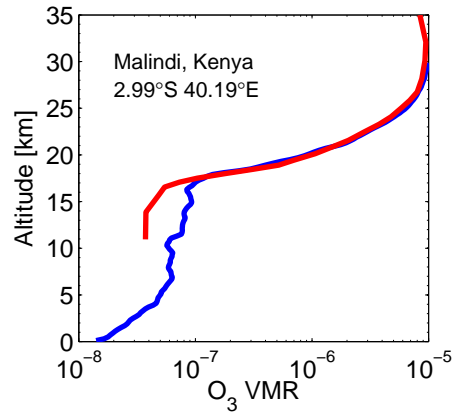


Figure 3: Comparison of modeled ozone (red) and SHADOZ measurements (blue). The profiles are a yearly average of 2004.

## 2 Relative contribution of individual source regions to TT20 abundance in the TTL

The figures 4 to 6 show the relative contribution to the idealized bromoform tracer (TT20) abundance of the individual source regions to different areas, including the source regions themselves, the tropics, mid-latitudes and high-latitudes. As it can be seen, up to approximately 12 to 14 km the corresponding source region is dominating the TT20 distribution, above this altitude the West Pacific region becomes the most important source. This confirms our proposition that the West Pacific region is the dominant pathway for VSLs into the stratosphere.

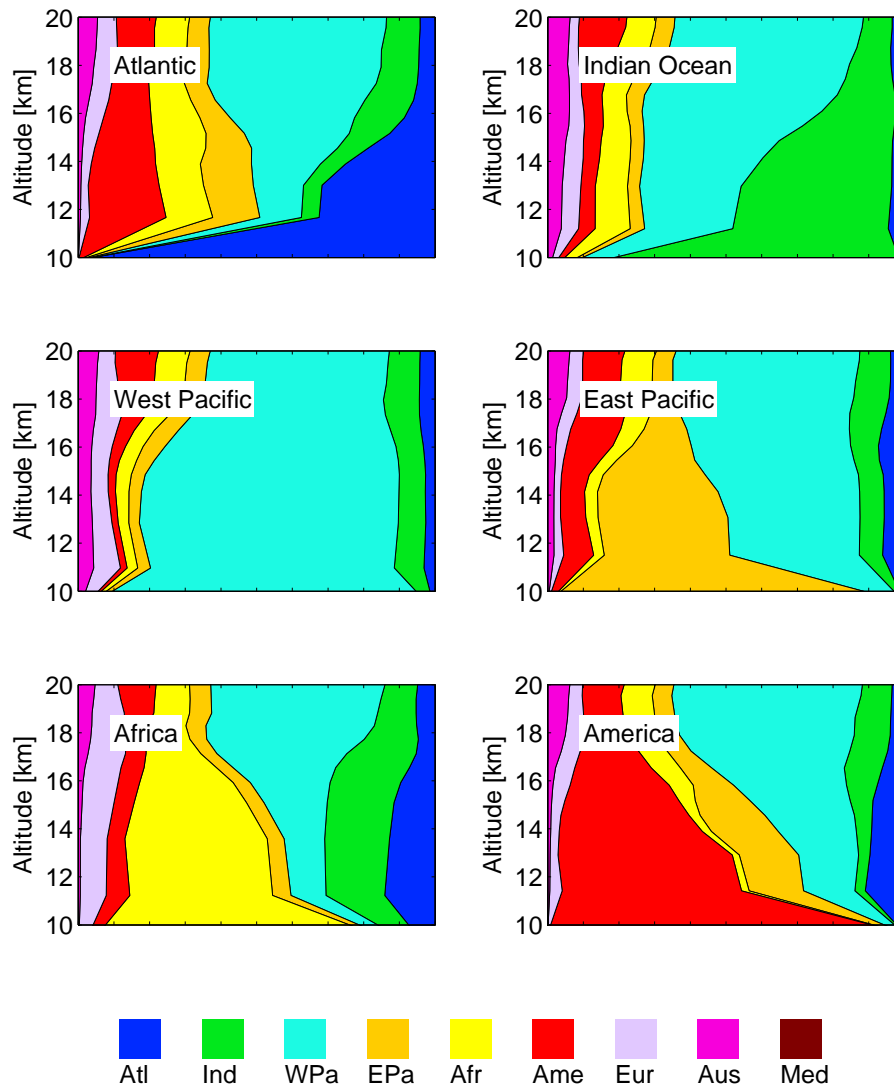


Figure 4: Relative contribution of different source regions to TT20 abundance in particular regions. See also Fig. 12 in the paper.

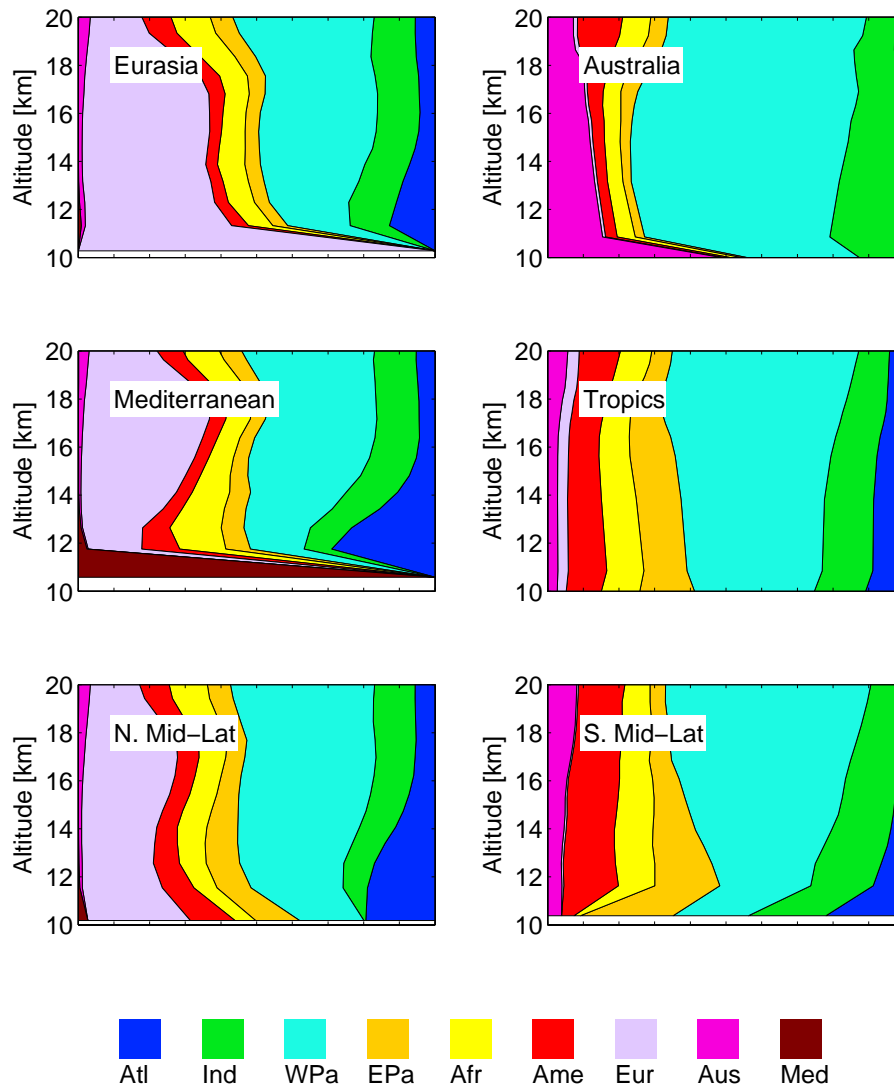


Figure 5: Relative contribution of different source regions to TT20 abundance in particular regions. See also Fig. 12 in the paper. “Tropics”, “N. Mid-Lat” and “S. Mid-Lat” denote the area between 20°N and 20°S, 20°N and 60°N and 20°S and 60°S, respectively.

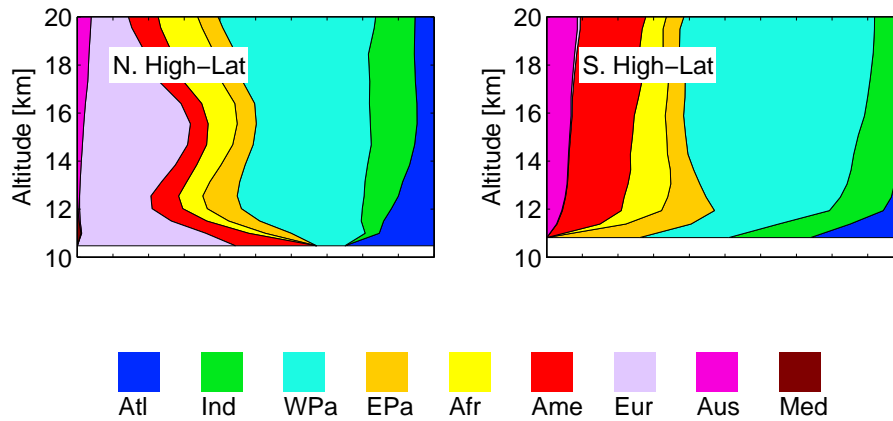


Figure 6: Relative contribution of different source regions to TT20 abundance in particular regions. See also Fig. 12 in the paper. “N. High-Lat” and “S. High-Lat” denote the area above  $60^{\circ}\text{N}$  and below  $60^{\circ}\text{S}$ , respectively.

## References

Thompson, A.M., J.C. Witte, S.J. Oltmans, F.J. Schmidlin, J.A. Logan, M. Fujiwara, V.W.J.H. Kirchhoff, F. Posny, G.J.R. Coetzee, B. Hoegger, S. Kawakami, T. Ogawa, J.P.F. Fortuin, and H.M. Kelder, Southern Hemisphere Additional Ozonesondes (SHADOZ) 1998-2000 tropical ozone climatology 2. Tropospheric variability and the zonal wave-one, *J. Geophys. Res.*, Vol. 108 No. D2, 8241, doi: 10.1029/2002JD002241, 31 January 2003.