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Atmospheric Measurement Techniques Discussions

Interactive comment on "Observation of the exhaust plume from the space shuttle main engine using the Microwave Limb Sounder" *by* H. C. Pumphrey et al.

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The referee requests an additional comment on why the low resolution of the retrieved product makes it hard to interpret. But I am not sure what he wants me to say. The nature of the averaging kernels is shown in Lambert et al. (2007).

The referee asks why I use "left edge, centre, right edge" in the caption of figure 1, rather than giving MAF or profile numbers. This was for two reasons. Firstly, it allows the reader to know what you mean without reading the axis labels. Secondly, the MAF numbering and profile numbering is different by approximately 6, so one would have

to choose which axis to use. I have added profile numbers to the caption but would appreciate editorial guidance on whether to use numbers, right/centre/left, or both.

The referee asks "Why wouldn't a retrieved profile coincide with a limb scan?" It doesn't for reasons which are too complicated to describe in this paper, so I have merely referenced Livesey et al. (2006) which describes the MLS retrieval process in some detail. (The main contributing factors are (a) that we perform a tomographic retrieval, estimating a number of profiles from a number of limb scans, and (b) the Earth is not spherical.)

The referee asks us to label the colour bars in Fig. 1. We have done this.

The referee asks whether the bottom panel is Fig. 2 is typical or enhanced. The point of this figure is that the top panel (now labelled (a)) is enhanced while the bottom panel (b) is typical of non-enhanced conditions at this latitude. I have altered the caption to make this clearer.

In common with RC C1366, the referee asks for the dates of the possible enhancements near Baikonur and Guiana — we handle this request as noted in our replies to RC C1366 and RC C1691.

The referee requests a scale for the sizes of dots in figures 4 and 5. We have added this.

References

Lambert, A., Read, W., Livesey, N., Santee, M., Manney, G., Froidevaux, L., Wu, D., Schwartz, M., Pumphrey, H., Jimenez, C., Nedoluha, G., Cofield, R., Cuddy, D., Daffer, W., Drouin, B., Fuller, R., Jarnot, R., Knosp, B., Pickett, H., Perun, V., Snyder, W., Stek, P., Thurstans, R., Wagner, P., Waters, J., Jucks, K., Toon, G., Stachnik, R., Bernath, P., Boone, C., Walker, K., Urban, J., Murtagh, D., Elkins, J., and Atlas, E.: Validation of the Aura Microwave Limb Sounder middle atmosphere water vapor and nitrous oxide measurements, *J. Geophys. Res, 112,* D24S35, doi:10.1029/2007JD008752, (2007).

Livesey, N. J., Snyder, W. V., Read, W. G., and Wagner, P. A.: Retrieval algorithms for the EOS Microwave Limb Sounder (MLS) instrument, *IEEE Trans. Geosciences and Remote Sensing, 44,* 1144–1155, (2006).

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 3971, 2010.