

Interactive comment on “ Coherence of long-term stratospheric ozone vertical distribution time series used for the study of ozone recovery at a northern mid-latitude station” by P. J. Nair et al.

N. Harris (Referee)

neil.harris@ozone-sec.ch.cam.ac.uk

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This paper describes the comparison of the 25 year time series of Lidar ozone measurements made at the Observatoire de Haute Provence with satellite measurements and with co-located sonde and Umkehr measurements. It is clearly structured and written and is a valuable contribution to the subject.

There are two significant points I would like to make:

1. I think it would be valuable if the authors could highlight the 2001-2005 period slightly
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more. This would allow then to indirectly compare the 'new' satellite instruments to SAGE and HALOE and possibly allow them to say something about the possibility of extending those records. I am not suggesting much additional work, just that the authors should make the implications of the current work clearer. A drift of 1%/decade has become the achieved target for drift in combined total ozone time series - what might be achievable for ozone concentrations at 20km, 25km, etc.?

2. A statement or discussion about the stability of the lidar system is needed in section 2.1.1 in order to underpin the later discussion about drifts in section 4.3. Ideally the authors should give their best estimate of the possible drift of the lidar system based on instrumental considerations alone.

Minor comments

28520, 17 '...stratosphere, with a near zero bias...'

28520, 25 Be more precise when saying 'ozone recovery'

28521, 17+ The levelling off can be attributed to Cly changes In some regions, but not all. Need to mention dynamical changes in regard to the Northern hemisphere

28528, 8+ Rephrase this sentence as the word 'voltage' comes as a bit of a shock!

28531, 3+ It is not quite clear why a coincidence is not used if it meets the selection criteria. I doubt it makes much difference, but I would think that all acceptable overpass measurements should be used to estimate instrumental differences. (If there are enough days on which multiple overpasses occur, then the dependence on distance could be studied.)

28532, 11 Can this sentence ('These results...') be rewritten as it is rather cryptic?

28532 21+ 'The vertical resolutions of.....GOMOS) are similar to that of...'

28533, 2 The important point is that the difference between geopotential height and geometric altitude does not affect derived ozone values even in regions with steep

gradients. So it is probably worth re-stating this in terms of ozone.

28535, 20 delete 'only'

28536, 11 'A similar result...'

28537, 5 I do not think 'Additionally' is the right word. 'Alternatively' or 'A further factor' seem better. However the authors should make a judgement as to what they think caused the discrepancy. Given the other studies it seems reasonable for them to say '...variations are probably due to the..' in lines 1 and 2, and then to say 'It should be noted, however, that the Dobson...'

28537, 21+ '...comparisons of..... exhibit smaller.'

28544, 7+ I doubt the differences are only due to atmospheric variability. Satellite measurements are worse below 20 km as well.

Neil Harris

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