

## ***Interactive comment on “Water vapor total column measurements using the Elodie Archive at Observatoire de Haute Provence from 1994 to 2004” by A. Sarkissian and J. Slusser***

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### 1) Trend Calculation

1.a) Section 5 Chapter 5 p1083 line 11 Sentence A negative trend of  $-0.44 \pm 0.24 \times 10^{22}$  molecule  $\text{cm}^{-2}$  per 10 years is obtained after removing the sine fit.

is replaced by

A negative slope of  $-0.44 \pm 0.24 \times 10^{22}$  molecule  $\text{cm}^{-2}$  per 10 years is obtained after removing the sine fit, indicating a not significant trend because

C257

it is larger than two times its error. This is in agreement with the review of measured trends over Europe made by [Morland](#). This negative slope might be introduced by the high summer values in 1994 and 1995. We believe that more detailed trend calculation, including seasonal trends calculations, could be made after we extend this analysis to the full Elodie Archive and to the Sophie Archive.

Also in caption of fig 7:

A negative trend of  $-0.44 \pm 0.24 \times 10^{22}$  molecule  $\text{cm}^{-2}$  per 10 years is obtained after removing the sine fit.

is replaced by

A negative slope of  $-0.44 \pm 0.24 \times 10^{22}$  molecule  $\text{cm}^{-2}$  per 10 years is obtained after removing the sine fit.

### 1.b) Validation

p1084 line 5

The calibration of the lidar gives by few percent better agreement with our measurements than with radiosondes, but we need more co-located and simultaneous observations for validation.

is replaced by

The calibration procedure uses the variance between radiosonde profile and lidar profiles between 2 and 8 km calibrated with our total column values on available days of lidar observation. This variance varies from 0.4 at 2 km to nearly 1 at 5 km, decreasing to 0.6 at 8 km is due to the natural time variability of atmospheric water vapor. The decrease of this variance by few percent observed when using Elodie water vapor data gives information on the validity of our measurements, but we need more co-located and simultaneous observations for better validation.

### 2) Minor suggestions, all agreed

C258

p. 1077-114 its involvement in stratospheric ozone equilibrium in the troposphere  
is replaced by

its involvement in stratospheric ozone equilibrium due to the contribution of the  
troposphere-stratosphere exchanges

p.1081-115

The differential optical absorption spectroscopy (DOAS) method is used commonly  
because using scattered light increases the path length up to 20 air masses.

is replaced by

The differential optical absorption spectroscopy (DOAS) method is used commonly  
for tiny absorptions and because of geometrical considerations, using scattered light  
(zenith sky light at twilight) increases the path length up to 20 air masses.

p.1083-118

Secondly, saturation effects on strong absorption lines in the  $500\text{--}550\text{ nm}$  range are not  
negligible

is replaced by

Secondly, saturation effects on strong absorption lines in the  $500\text{--}550\text{ nm}$  range at  
592 nm are not negligible

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