

## ***Interactive comment on “Tropospheric water vapour above Switzerland over the last 12 years” by J. Morland et al.***

### **Anonymous Referee #1**

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The problem of detecting trends in water vapor is important to climate research, and, as the authors state, is limited by the lack of long time series of good data. To this end, the authors present an analysis of some 10 years of radiometer data, and supplement it with comparisons between several other sets of data. In addition to deriving a useful data set, the authors also demonstrate some of the problems that might be encountered in deriving trends from a long term data set. I recommend publication of the work, with some minor modifications.

Technical comments: (1) The abstract should also mention the use of GPS and SPM data. (2) P2. ERA-40 is not defined. (3) P2, Last par. TROWARA should be defined the first time that it is used. Perhaps, the authors could say “see Section 2.1). (4) P4, Sect. 2.5. It would be good to give the coordinates of the nearest ECMWF

grid point. (5) P8. Eqn. (4). Should use the common symbol for partial derivative. (6) P11, sec. 4.2 NCEP-NCAR is not defined. (7) P13, Sec. 5.1. It would be good to give the equations used for the LSA analysis. Also, why are three sine and cosine harmonics used? The discussion on fig. 5 needs to be expanded. (8) Conclusions. On the difference between GPS and TROWARA. It could be checked by examining the difference between GPS and TROWARA during non raining conditions. I think that the differences found, possibly due to limited sampling by TROWARA, are important. Also, I don't understand why the GPS-TROWARA mean difference is so large. Could it be the result of using an out-of-date absorption model used in Wu (1979) (9) Fig. 9: what is the green line?

Grammatical suggestions: (1) P2, L5. better to say: &#8220;500 mb from radiosonde&#8221;; (2) P3, Sec. 2.1, L2. Better to say &#8220;near a water vapor&#8221;;. (3) P16, 2L from bottom. Better to say:&#8221;&#8230;positive trend if these data are included in a future &#8230;&#8221;.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 7239, 2009.

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