

Interactive comment on “Estimating trends in atmospheric water vapor and temperature time series over Germany” by Fadwa Alshawaf et al.

Anonymous Referee #2

Received and published: 3 July 2017

Comment to: Estimating trends in atmospheric water vapor and temperature time series over Germany, by Alshawaf, Balidakis, Dick, Heise and Wickert, AMT-2017-69

The authors analyse PWV trends in datasets of different origin: Ground-based GNSS, NWP reanalysis, and ground-based weather station data.

The most interesting part of the article concerns the GNSS data, which is also the main field of expertise of the authors. Despite the GNSS time series not being as long as the authors would like, I recommend to put more emphasis on those results, despite the time series not being as long as the authors would have liked.

It is also interesting to see the strong gradient over Germany of the PWV trend in the ERA data, versus no clear gradient in the GNSS data. I recommend to do the ERA

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analysis for the same period as covered by GNSS in figure 10 c and d. It is unclear to which degree different time series are included in figure 10 c and d. From figure 8 it is clear that the large variations from year to year of the "trend component", means that differences in time extent risk leading to local variations in figure 10 c. Are there sites enough to do a "clean" figure 10 c, with all sites covering the same period?

Put less emphasis on PWV from ground based meteorological measurements. Even if there is a relation, it is certainly not going to be the way in which we determine PWV variations and trends in the future.

A few more detailed comments

page 2. PWV trends are not similar in all regions, please detail if for example Bengtsson et al cover the same region as you.

page 3 Specify already here the resolution of your vertical ERA profiles (when you finally give the number, you have already used the profile information several times).

page 4, line 13. ..regression -> relation

why not provide eq 6 and 7 already in connection with eq 5?

page 5. When assessing the shortcomings of finite ERA resolution, why not also check interpolated ERA data directly at the meteorological sites for a clean answer?

page 6 line 21. The standard error of the PWV estimate was deduced against which data?

Figures: In some of the figures PWV differences are shown, but the "sign" is not mentioned. Is it $PWV_{GNSS} - PWV_{ERA}$, or vice versa?

Interactive comment on Atmos. Meas. Tech. Discuss., doi:10.5194/amt-2017-69, 2017.

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