Manuscript Review

Title: Characterizations of Europe's integrated water vapor and assessments of atmospheric reanalyses using more than two decades of ground-based GPS

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This manuscript investigated the multi-temporal-scale variabilities and trends of IWV and assessed six commonly-used atmospheric reanalyses (CFSR, ERA5, ERA-Interim, JRA55, MERR2, and NCEP2) over Europe using IWV time series from 108 GPS stations for more than two decades. I have the following comments:

Main comments:

1. The authors have taken into account of vertical IWV adjustment. However, the height system of GPS is different from that of the reanalyses. I'm not sure if the authors have considered the unification and differences of the different height systems?
2. In the manuscript, the authors used the difference time series between ERA5 IWV and GPS IWV to visually detect the breaks in GPS IWV, so the potential significant differences may be eliminated since the homogenization, also this may be the reason why the ERA5 outperforms than other reanalyses. Are these breaks based on ERA5 IWV still significant, are there any other reanalyses used for the homogenization process?
3. The spatial resolution contributes to most of the representativeness differences, such as the ERAI provides the products with higher spatial resolution (i.e. 0.25°) than the product used in this paper (0.75°). The conclusion that ERA5 has the best performance on the representativeness differences is questionable. This needs more clarification or convincing statements.
4. Line 202: "The 3- and 6-hourly IWVs are linearly interpolated into 1-hourly time series." Have the authors assessed the accuracy of the interpolated IWV? For IWV which changes in a high frequency, linear interpolation seems to be not a good choice.
5. Line 157: There seems to be a missing full stop between "reanalyses" and "Compared". Please check it.