

# ***Interactive comment on “Consistency and representativeness of integrated water vapour from ground-based GPS observations and ERA-Interim reanalysis” by Olivier Bock and Ana C. Parracho***

## **Anonymous Referee #2**

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The manuscript examines the consistency and representativeness differences of daily IWV data from ERA-Interim reanalysis and GPS observations at 120 global sites. The differences are analyzed in details by correlating with various factors and developing a representativeness error statistic using the reanalysis values over the four grid points surrounding the GPS station. The study itself has some values although the scientific originality and applications are not very appealing. Minor comments: 1. I think that one of main motivations for studying the spatial representativeness error is to provide such information to the data assimilation. This should be mentioned in the introduction

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along with the current knowledge of the spatial representativeness error of the GPS-derived PWV and whether and how this study tackles this issue. For example, Liou et al. (2001, Comparison of precipitable water observations in the near tropics by GPS, microwave radiometer, and radiosondes. *J. Appl. Meteor.*, 40, 5–15) discussed the sampling differences among different measurement techniques. 2. Page 3, L17-19: “Indeed, large representativeness differences put a limit to the use of reanalyses data as a reference for detecting breaks in the GPS time series. Outlying sites should be detected and discarded.” This is a very good point. Comparing the point measurement with the reanalysis has been often used for homogenization. It would be useful to have some results or at least more discussions on this application. 3. Page 4, L21: averaging the values from the surrounding four grid boxes has been used in Mears et al. (2014, Intercomparison of total precipitable water measurements made by satellite-borne microwave radiometers and ground-based GPS instruments, *J. Geophys. Res. Atmos.*, 120, doi:10.1002/2014JD022694) for satellite data.

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