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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Comparison of IAGOS in-situ water vapour measurements and ECMWF ERA-Interim Reanalysis data" *by* P. Reutter et al.

Anonymous Referee #2

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Review of the study entitled 'Comparison of IAGOS in-situ water vapour measurements and ECMWF ERA-Interim Reanalysis data' by Reutter et al.

The study compares 10 years of IAGOS measurements of air temperature, water vapour and relative humidity with ERA-Interim reanalysis data near the tropopause over the North Atlantic Ocean. The analysis focuses on regions substantially saturated with respect to ice, known as ice supersaturated regions, which are regions in which cirrus clouds are formed in the northern mid-latitudes. Comparisons are performed using statistics involving the median, mean and standard deviation, and are illustrated using probability density functions (non-cumulative and cumulative) and box-and-whisker diagrams. The comparisons refer to the period 2000 to 2010. The study is well written and I recommend publication after revision as follows:

Major comments

The study shows the good ability of IAGOS measurements to capture small scale ISSRs (smaller than 100 km) and at the same time gives credit to the ERA-Interim model to depict large scale ISSRs (larger than 100km). These are important findings which merit publication as far as our knowledge on the detection of ISSRs from different datasets. However, presenting only pdfs and boxplots in a comparison study is not sufficient to justify publication in a journal as such ACP. The authors should make deeper comparisons with their ISS data. For instance:

1) They could perform simple time series analysis for their region (40-60N, 5-65W) and plot the monthly time series of the two ISS datasets from 2000 to 2010, compare the seasonal cycles, and then correlate the two time series after removing the seasonal variability.

2) It has been shown that cirrus cloud variability is significantly affected by the North Atlantic Oscillation during winter (Eleftheratos et al., 2007). The authors could test if a correlation between the deseasonalized ISS data and the NAO index exists.

Technical corrections

P3 l16: correct 'asses' to 'assess'.

P3 l26: correct 'continous' to 'continuous', correct 'greenhous' to 'greenhouse'.

P4 l2: you say '40N-60N, 5-65W' but on p5 l16 you write 'from 40o to 60o North and -65o to 5o East'. Please write the correct coordinates for longitude.

P4 l15: what is the '4s resolution'?

P8 table 3: for the case of TL, the mean VMR are 61 (IAGOS) and 31 (ERA). Is the value for ERA correct?

P9 l15: where do you compare 'the seasonal cycle'?

P9 l16: there is larger variability in the in-situ data. Why do you say 'smaller variability'?

P12 l6: correct 'profil' with 'profile'.

P14 l13: correct 'similiar' with 'similar'.

Reference

Eleftheratos, K., Zerefos, C. S., Zanis, P., Balis, D. S., Tselioudis, G., Gierens, K., and Sausen, R.: A study on natural and manmade global interannual fluctuations of cirrus cloud cover for the period 1984–2004, Atmos. Chem. Phys., 7, 2631-2642, 2007.

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