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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Comparison of IASI water vapor retrieval with H_2O-Raman lidar in the frame of the Mediterranean HyMeX and ChArMEx programs" *by* P. Chazette et al.

Anonymous Referee #2

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General Comment

The paper by Chazette et al. compares EUMETSAT operational level-2 IASI products (Water vapor mixing ratio and aerosol profiles) with in-situ WALI Raman-lidar measurements very well co-located in space and in time. The comparison is presented both for water vapor and aerosol vertical profiles in addiction with water vapor integrated amount, for a data set of about 30 profiles recorded during HyMeX and ChArMEx campaigns. The campaigns cover fall (2012) and summer (2013) periods and where held at Menorca Island in the Mediterranean basin. The good agreement between lidar measurements and water vapor operational products, leads the authors to state

that this product can be considered for meteorological and climatic applications.
I think that the present paper deserves publication on ACP journal but specific points listed below should be properly addressed.

Specific Comment

The main point is related to the lack of description of retrieval methodologies framework of the IASI products used and cited in this paper. Even if the article does not aim to describe the IASI H2O operational products, the authors should at least distinguish between results obtained with statistical retrieval (such as EUMETSAT IASI L2 products) and physical retrieval (i.e. Masiello et al. 2013 reference in the paper). In the literature it is widely known that the former methodology has a poorer vertical resolution with respect to the latter. As an example the authors can compare panel 11 of Figure 3 and Figure 9.a) of Masiello et al. 2013. In both cases the lidar sees a dry line around 2-5 km in agreement with ECMWF analysis. But in the first case IASI product is smoother then lidar profile and does not see the dry line, while in the second case IASI is capable to fit this kind of structure. The difference is for sure related to the type of methodology behind the products: the first one uses a statistical approach and the second one a physical retrieval scheme. This information should provide to the reader a better description of the quality of vertical profiles derived from Hyperspectral satellite measurements. In addition the authors, to state the capability of retrieving Water Vapor mixing ratio profiles on a Global scale, cited Amato et al. 2009 paper. The methodology described in this article is based on Statistical approach, while the dataset used in this article has been processed with physical based methodology in another paper of the same journal number (Masiello et al. 2009).
The second point is related to the Introduction section. I find it is a bit unfair and misleading that the authors dealt with history of Water vapor retrieval jumping from TIROS to TES neglecting the heritage of the Japanese Fourier Transform Spectrometer IMG.

Minor point

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Reference Hilton et al. 2012 appears twice at pages 14089 and 14090. The second one seems to be correct!

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 14071, 2014.