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Interactive comment on “First Odin sub-mm retrievals in the tropical upper troposphere: humidity and cloud ice signals” by M. Ekström et al.

Anonymous Referee #3

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General comments: The paper addresses the retrieval of humidity in two regions of the UTLS, at approx. 200 and 130hPa based on sub-mm spectra from ODIN satellite at 501GHz and 544GHz. Despite substantial calibration errors the author claim to retrieve some averaged humidity information in tropical regions. For the layer at 200hPa data are compared with humidity information from MOZAIC in situ measurements though not really a validation in its proper sense. Retrieval is based on the well established ARTS package. The main message of this paper is to show that humidity also in the presence of ice clouds can be retrieved in principle from submm-spectra. Due to severe calibration issues the resulting atmospheric data are more of qualitative use. The main strength of the paper is to illustrate the retrieval concept for humidity in the

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UTLS based on submm spectra which as such is new. The paper would win a lot if the authors would perform the additional work they recommend to do themselves. So far it is a good concept study.

Specific comments: Though the authors indicate and discuss in some detail the problems in calibration, they actually do not explain what the origin really is. It would be helpful to know what the exact origin of the issue is and whether something can be done against it in the future. The authors state that for the scientific usage of the data a higher precision in the calibration is needed and they strongly recommend further studies. It is not clear why this was not done so far.

Also pointing is an issue and it is said that potential exists to reduce this uncertainty and will be done in a further retrieval product. It remains unclear why it has not been done for this analysis.

Comparison with in situ MOZAIC would be of extreme value. Almost 1800 flights entering the tropics were analysed. However later in the paper it is stated that there are too few flights to allow a comparison with data separated geographically. Instead of a proper validation only a histogram comparison is given. It is somewhat disappointing that the authors claim "that the purpose of this paper is not to investigate the data set in detail".

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 8649, 2006.

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