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Interactive comment on "First retrieval of global water vapour column amounts from SCIAMACHY measurements" *by* S. Noël et al.

S. Noël et al.

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General remark:

We thank A. Maurellis for his helpful comments. Answers to the specific questions are given below.

Specifics:

1. It is explicity stated in the text (end of section 2) that "the water vapour results presented here are not based on the official SCIAMACHY Level 2 data products but have been derived from preliminary data." In fact, the analysis uses the currently available SCIAMACHY Level 1 Offline product as input. The data have been extracted by the standard ESA software. No special calibration has been performed by the authors, except that a dedicated solar spectrum (also provided

by ESA) has been used. The latter is clearly mentioned in the text (first paragraph of section 4.1). Therefore, the paper makes clear that the input data are not optimal with respect to calibration, but also shows that even with these spectral data good results can be achieved.

2. The main aim of the paper is to show that global water vapour concentrations can be derived from SCIAMACHY data with acceptable quality. This is done by applying two already available (different) algorithms to the data. It is clear that these are not the only or best algorithms which could be used to derive water vapour concentrations from SCIAMACHY measurements (see the corresponding references in section 1 which, by the way, also include the Wagner et al., 2003, paper). The SCIAMACHY results are then compared with independent sources to judge upon the quality of the SCIAMACHY data. As reference sources SSM/I and ECMWF data are used. We decided not to use GOME water vapour data for this purpose because there is currently no validated operational GOME water vapour product.

3. The paper shall show the capabilities of SCIAMACHY and not of certain algorithms. We will include the reference to Lang et al. (2003) in the revised version of the paper.

4. Within the context of the error studies mentioned below it turned out that the AMC-DOAS results presented in the paper have been derived using inadequate pressure and temperature profiles. New calculations (with correct settings) have been performed, which indicate that the AMC-DOAS results systematically underestimate both the SSM/I and ECMWF columns, which is now consistent with the WFM-DOAS results. Therefore, the AMC-DOAS water vapour columns to be presented in the revised version of the paper will also been scaled by a factor of 1.1. Note that the correlation of the data sets is only hardly effected by this, and that the results of the study remain essentially unchanged. However, since both

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algorithms reveal a similar offset this offset is probably caused by systematic errors. Possible reasons for this offset will be discussed in the revised version of the paper.

5. We agree that additional information on the sensitivity of the algorithms may be useful and we will add the results of a more detailed error analysis (including the effect of different albedos) for both algorithms in the revision of the paper.

Finally: We used the term “near-visible” to distinguish the spectral range of the water vapour retrieval used in the present study from the more commonly used near-infrared spectral range. Although “near-visible” may not be common parlance, we think the term is not misleading and useful in this context.

Interactive comment on Atmos. Chem. Phys. Discuss., 3, 5659, 2003.