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Atmospheric Measurement Techniques Discussions

Interactive comment on "A feasibility study for the retrieval of the total column precipitable water vapor from satellite observations in the blue spectral range" *by* T. Wagner et al.

Anonymous Referee #2

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The authors demonstrated the feasibility to retrieve water vapor from satellite observations in the blue spectral region. They tested blue retrievals of SCDs of water vapor from both GOME-2 and OMI data. Unlike OMI data, GOME-2 data contain both blue and red spectral ranges for water vapor retrievals. They performed both red and blue retrievals from GOME-2 data to allow direct comparison and discuss of the red/blue retrieval differences. They also showed the GOME-2/OMI blue retrievals differences for both values and retrieval uncertainties. To discuss the differences among different datasets of water vapor SCDs, the authors performed representative (e.g., in surface albedo) RTM calculations of AMFs over both clear and cloudy conditions and care-

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fully explained those differences. Although the retrieval uncertainties from the blue retrievals are significantly larger than those in red retrievals, the authors illustrated several advantages of blue retrievals. This paper is suitable for publication on AMT. It is well written and organized. Although the blue retrievals of using 430-450 nm especially the fitting window might not be as optimized as the red retrievals, it is adequate for the feasibility study. Overall, I would recommend it to be published on ATM after the following minor comments are addressed.

Specific comments

1. P3644, L5, change “is systematically” to “are systematically”

2. P3647, L5 and in Fig. 1, for H2O cross section, what pressure is used as the cross sections depend on both temperature and pressure? Please specify it.

3. In Fig. 2, it seems to me that the black lines are the fitted optical depths for the specific species plus fitting residuals. If that is the case, please make it clear. I think that it does not mean the same as “respective features in the measured spectra”

4. P3651, first paragraph, according to the calculated AMFs in Figure 4 and Table 1, the AMF is significantly larger in the blue over the ocean, and is significantly larger in the red over land. But from Figure 6, blue retrievals are significantly larger than red retrievals over the ocean, but read retrievals are comparable or slightly larger than blue retrievals over the land. Why is that? Could be due to some positive systematic biases from the blue?

5. P3652, last paragraph of section 4.1, it might be better to move/merge this paragraph to P3651, L16-17, which discusses the reasons for possible differences.

6. P3652, L14-15, should it be June 1 and June as it is inconsistent with Figure 9?

7. P3653, L5-7, the consistency between ocean and land using blue is considered as the first advantage, but not quantitative estimate is provided about the magnitude of inconsistency from red retrievals. It would be very useful to provide an estimate about

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this.

Interactive comment on Atmos. Meas. Tech. Discuss., 6, 3643, 2013.