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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Glyoxal vertical columns from GOME-2 backscattered light measurements and comparisons with a global model" *by* C. Lerot et al.

Anonymous Referee #2

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The paper by C. Lerot et al. "Glyoxal vertical columns from GOME-2 backscattered light measurements and comparisons with a global model" reports on a retrieval of glyoxal from the satellite instrument GOME-2. It presents and discusses the retrieved glyoxal vertical column densities and compares them with columns calculated from the IMAGESv2 model. The retrieval benefited particularly from the use of a liquid water cross-section, which improved the quality of the fit over the oceans. The paper meets the focus of Atmospheric Chemistry and Physics. It is well organized, clear and written in detail. I recommend the publication after the following questions are addressed:

page 21152 line 2/Table 1: The HITRAN data base was updated 2008 leading to sig-

nificant improvements. Why didn't the authors use a water vapor cross-section from the HITRAN 2008 data base?

page 21153 lines 16-18: In the 405-490 nm wavelength range window, a significant NO2 absorption can be expected. What are the reasons that no NO2 cross-section was included? The liquid water cross-section is very broad-banded. What is the impact of the degree of the fitted polynomial to the value of the liquid water optical density?

p. 21153 line 19: typo: "betwen" –> "between"

Figure 5: Can the authors provide a physical explanation for the liquid water distribution shown in Fig. 5? Can the authors comment on the reliability of the glyoxal retrieval in case the distribution does not have a physical explanation?

page 21163 lines 1-2 and page 21166 lines 22-23: I agree with the editor in terms of the claimed consistency between the ship measurements and the retrieval described in this manuscript. How can a glyoxal layer in the lowest 700m be consistent with the assumed profile shape used in the retrieval?

page 21166 lines 5-6: "In this error budget, the neglect of absorbing aerosols has not been considered." Can the authors rephrase this sentence since it is confusing?

Interactive comment on Atmos. Chem. Phys. Discuss., 10, 21147, 2010.