

Interactive comment on “Characterization of blackbody inhomogeneity and its effect on the retrieval results of the GLORIA instrument” by Anne Kleinert et al.

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We thank the referee F. Dupont for reviewing the paper and the valuable comments. Our answers to the comments are given below. Relevant referee comments are inserted *in italics*.

Page 9, line 4 : The text indicates a range from 10-100 while Figure 5 rather suggests 10-15 pixels. Please justify the 10-100 range.

Figure 5 only demonstrates the general relation between the error in blackbody temperature (abscissa) and the error in the retrieved atmospheric parameter (color coded)

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for different correlation lengths of the blackbody error as derived from the Monte-Carlo study. It does not give any information about the actual correlation lengths of the GLORIA blackbodies.

Our justification that our blackbody temperature error has correlation lengths of 10-100 pixels is based on the physical considerations that (a) due to the thermal conductivity of the material, temperature variations across the surface have to be rather smooth and (b) the instrument is focused to infinity and therefore one pixel "sees" a spot of about 30 mm diameter on the blackbody surface.

We have added a corresponding sentence on page 6, line 13, in order to make this more clear: "Due to the optical setup and the thermal conductivity of the blackbody surface, typical correlation lengths of the GLORIA blackbodies are expected to be in the range of 10 to 100 pixels. Temperature variations across the emitting surface have to be rather smooth because of the thermal conductivity of the material. Furthermore, the instrument is focused to infinity and the picture of the blackbody backplane on the detector is not sharp. Therefore correlation lengths below 10 pixels are not expected."

Page 9, line 11 : The text associates the temperature standard deviation of the blackbody to the blackbody uncertainties and indicates that the O3 retrieval requires a 100 mK value. I would suggest to clarify that the 100 mK corresponds to (1-sigma) with the mention 100 mK (1-sigma)

Following a suggestion from reviewer 2, we have now stated at the end of the introduction, that all uncertainties shall be understood as 1-sigma standard deviation values if not indicated otherwise. We also slightly changed the formulation on page 9, line 11, to make more clear that the values given are standard deviations.

Page 2, line 5, sentence added: "All uncertainties given in the text shall be understood as 1 σ values if not indicated otherwise."

Page 9, line 11, sentence changed to: "Thus, for the GLORIA instrument and the ap-

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plied retrieval setup, the ozone retrieval sets the threshold requirement of the standard deviation of the blackbody uncertainties to 200 mK and the desired target to 100 mK."

Page 13, Figure 8 : The figure on the right covers pixels 1 to 48 in the horizontal direction and pixels 1 to 128 in the vertical direction. The left figure covers the whole 128 x 128 pixels. I guess that the 1-48 area corresponds to the Horizontal Position 0-22.5mm, but I am not sure. Please clarify which area corresponds to whom in both figures.

The area covered by the detector array is approximately from -15 mm to +15 mm horizontally and from -40 mm to +40 mm vertically.

We have added this information in the text on page 12, line 3: "The area covered by the detector array is approximately from -15 mm to +15 mm horizontally and from -40 mm to +40 mm vertically."

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