

## ***Interactive comment on “Retrieval of sulphur dioxide from the infrared atmospheric sounding interferometer (IASI)” by L. Clarisse et al.***

### **Anonymous Referee #1**

Received and published: 23 December 2011

This is an important paper as the SO<sub>2</sub> product described here is used by the VAACs to advise the aviation industry. The paper gives the science behind this product. In general the paper is well written and I only have a few minor comments given below.

(i) Page 7244 last parag. As the author states the optimal estimation retrieval is more expensive than the method proposed here but nevertheless with modern supercomputers it is still feasible to tun this in real time as is already done for ash retrievals. One point in favour of not going to the expense of an OE retrieval is in this case the retrieval only weakly depends on the a-priori. If one was to try and retrieve SO<sub>2</sub> profiles however then OE would be more advantageous as the background water vapour profile would be important. This point could be made here. Indeed retrieving the height of the

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SO<sub>2</sub> plume would be of great interest.

(ii) Page 7246 line 6 it is not usual to refer to IASI channels as microchannels. I suggest using the former.

(iii) Page 7248 Last parag. I think a bit more detail on this dual estimate retrieval would be helpful with an example to show the differences between them. Note some users may find both solutions useful so they can decide in their own analysis systems.

(iv) Page 7250 line 18. I found Figure 7 and the text here a bit confusing. What does "retrieved total masses (as a percentage of the maximum)" mean? Please clarify.

(v) Page 7254 line 22 should read "...erupted, with all three releasing large amounts ..."

(vi) Page 7271 Fig 8 The total column water vapour is presumably very different for these two cases also which explains some of the differences.

(vii) Page 7272 Fig 9 The units should be added to the legend.

(viii) Page 7275 Fig 12 I am not sure this will show up very well in a published paper.

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Interactive comment on Atmos. Meas. Tech. Discuss., 4, 7241, 2011.

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