

Interactive comment on “An effective method for the detection of trace species demonstrated using the MetOp Infrared Atmospheric Sounding Interferometer” by J. C. Walker et al.

Anonymous Referee #1

Received and published: 21 December 2010

General Comments

This paper presents showcases the capabilities of IASI to detect spatial gradients of SO₂ and NH₃. The paper is well organized and in general well written. The channel selection technique appears to be a powerful tool, and it is well presented. However, in the case studies all the channels in very broad bands are selected, which could have been done with just a quick examination of the spectrum; this rather weakens the demonstration of the technique.

I think the authors should expand the conclusion section with a discussion on the ap-

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plicability of their methods and on the possibility of future work that would provide more quantitative retrievals. Please see below for some further sections that would benefit from more discussion.

Specific comments

Page 4536 Line 16: Please justify how errors in the profile shape can be ignored.

Page 4538 Line 8: Please explain how correlation in the covariance matrix suppresses systematic errors

Page 4542 Line 1: Provide a reference for the method (Dudhia et al., 2002?)

Page 4544 Line 11: Provide the typical SO₂ signal value

Page 4547 and following pages Provide the value used to normalize to fractional units.

Page 4548 The nu₃ SO₂ retrieval does not seem generally applicable. Water vapor is too strong an interferent for the modeling method and the ensemble method requires a new filter for every scenario. This should be discussed.

Page 4550 Line 2: The NH₃ band peaks at 967 cm⁻¹ not 950.

Technical comments

Page 4531 Line 6: and "the" spectral background

Page 4535 Line 7: In "that" work Line 14: "However" is not needed.

Page 4538 Line 5: retrieval

Page 4539 Line 20: due "to"

Page 4542 Line 14: m⁻²

Page 4544 Line 23: Internet reference? Line 28/29: "examine" used on both lines

Page 4545 Line 1: "if these other parameters have been suppressed" used in close

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succession Line 12: "vicinity"

Page 4546 and onward (including figure captions): Use "method" rather than "case"

Line 21/23: "however" used on both lines.

Page 4549 Line 25: Move "on the time scale of days" to beginning of sentence

Figure labels and axes on figures 3 through 9 should be very faint and hard to read.

They should be bolder.

Figures 10 and 13 captions: A map "is" shown

Interactive comment on Atmos. Meas. Tech. Discuss., 3, 4531, 2010.