

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 #2

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The paper by Walker et al. describes a new method for the detection of minor trace gases from spectrally high resolved remote sensing measurements. The method is applied to IASI data regarding the analysis of SO₂ and NH₃ enhancements with very promising results. Especially in case of NH₃ the improvement in sensitivity compared to existing standard methods is striking. Due to the fact that the new method effectively suppresses interfering spectral components, broadband regions of the spectrum can be used, thus, making it possible to exploit the full information on the target species. The authors argue that the method is mainly suited for the detection of minor species. However, they mention that some quantitative information might be retrieved. To be

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able to judge on this, it would be good if more quantitative comparisons with results of a full retrieval could be provided in the case studies.

Below only some minor comments:

p.4536, l. 10: ‘spectral offset’ It should be clarified that this variable is wavenumber-independent.

p.4536, l. 28: ‘where a uniform brightness temperature perturbation (1 K) is applied for all channels’ Can you explain a bit better. It sound that, in order to calculate K_i , you perturb the brightness temperature?

p.4544, l. 1: ‘ An an’ -> ‘An’

p.4544, l. 1: ‘an appropriate viewing angle correction was applied to the measured spectra before application of the filters.’ Could you describe this in more detail?

p.4544, l. 14: Which spectroscopy have you used for SO₂ and NH₃? Can you explain how spectroscopic errors in target and interfering species (e.g. H₂O-continuum) would affect your method?

p.4552, l. 5: ‘indicate indicate’ -> ‘indicate’

p.4552, l. 28: ‘to to’ -> ‘to’

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