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Comment

Interactive comment on “Measurements of O₃, NO₂ and BrO at the Kaashidhoo Climate Observatory (KCO) during the INDOEX (INDian Ocean EXperiment) Campaign using ground based DOAS (Differential Optical Absorption Spectroscopy) and satellite based GOME (Global Ozone Monitoring Experiment) data” by A. Ladstätter-Weissenmayer et al.

Anonymous Referee #2

Received and published: 19 November 2006

This paper presents measurements of O₃, NO₂ and BrO at the Kaashidhoo Climate Observatory during the INDOEX Campaign using ground based dual-axis DOAS and satellite based GOME data. The paper validates GOME total column observations

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of O₃ and NO₂, against ground based measurements. The GOME O₃ tropospheric columns derived by the Tropospheric Excess Method are validated against ozone-sonde observations. In addition to the GOME validation, i) a pollution event has been followed by the ground based dual-axis DOAS observations as well as by GOME and ii) the presence of BrO in the troposphere is highlighted and an upper limit of the tropospheric BrO column is derived from GOME.

Scientifically, the results from the INDOEX campaign that the manuscript presents are definitely worth publication in ACP, however the manuscript requires some (easy) restructuring to facilitate reading, improve clarity and highlight the messages to the reader.

Specific comments:

Abstract page 9274, line 26: where do the authors find information on BrO 'throughout the year' the moment the reported observations are for summertime.

1. Page 9274, last line: provide estimated detection limit in the abstract.
2. Page 9275: line 26: for multi axis DOAS, I have personally found very educative the paper by Hönninger et al., Atmos. Chem. Phys., 4, 231-254, 2004, www.atmos-chem-phys.org/acp/4/231/ and therefore, I believe it is worth citation in the introduction of the paper as well as later on in page 9281, line 17.
3. Page 9276, line 2: 'enables' should be in plural.
4. Page 9276, line 5: replace 'were to be' by 'have been'
5. Page 9276, lines 7-9: rephrase to make clear : 'validation' of what ? and also the purpose of the synergistic use of ground based observations remotely sensed GOME data and O₃-sonde measurements.
6. Page 9277, line 21: replace 'separated' by 'deduced'
7. Page 9279, line 10: remove 'a collection of'

8. Page 9279, line 15: Explain the choice of using a potential vorticity of 4 as threshold and not 3.5, 3 or even 2.5.

9. Page 9280, last sentence of section 3.1: Please explain the significance of this model result, a kind of mid-term conclusion.

10. Section 3.2: I suggest break down this section in 3 sub-sections: O₃, NO₂ and BrO, respectively since there is no obvious scientific link in these 3 parts except that the same instrumental approach is used. The authors might choose to link better the discussion on the 3 different molecules.

11. Page 9281, line 22: 'In this study...' start a new paragraph (sub-section on NO₂).

12. Page 9282, lines 11-12 and line 16: maximum should be 1 or 2 x1E15, can not be 1-2x1E15

13. Page 9282, line 23: 7x1xE15 correct to 7xE15

14. Page 9282, last paragraph: Could the authors comment on the sensitivity of the satellite based and the ground based sensors to the different part of the troposphere (boundary layer/ free and high troposphere) and how this affects or not the comparison of the results?

15. Page 9283, line 2-5: Provide location coordinates over which GOME measurements of NO₂ have been retrieved.

16. Page 9284, line 2: 'small amount of BrO' whereas in the abstract page 9274, line 25, it is mentioned 'large tropospheric contributions to BrO budget'. Is there something I miss?

17. Page 9284, last 2 lines and first 2 lines in page 9285: this sentence requires rephrasing for clarity.

18. Page 9185, lines 13-19: I would move this discussion on BrO earlier in the conclusion in page 9284, line 14 and finish the conclusion with a kind of perspective for future

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Discussion Paper

studies.

19. Page 9295: figure 5: why is there only one point from ground based NO₂ observations? To support the discussion on pollution events, at least a few more ground based observations of NO₂ should be shown.

20. Page 9296: figure 6: are there any BrO ground based observations? If yes, they should be shown in Figure 6.

Interactive comment on Atmos. Chem. Phys. Discuss., 6, 9273, 2006.

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