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Interactive Comment

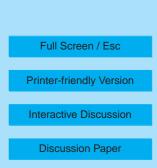
## *Interactive comment on* "Direct observation of two dimensional trace gas distribution with an airborne Imaging DOAS instrument" *by* K.-P. Heue et al.

## Anonymous Referee #1

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Heue et al. introduce a novel technique airborne Imaging DOAS for investigation of two dimensional trace gases distribution on a small scale. The measurements of NO2 distributions by aircraft over the industrialized area in South Africa are presented. The NO2 columns were used to estimate NO2 flux and compared with satellite data. The manuscript is well written. The topics addressed here are well within the scope of ACP. However, some specific comments are as following:

Page 11885, line8-9: "A normal in-flight spectrum in a remote and clean area is usually taken as the reference here". To have a good reference spectrum is very important for retrieving the weak absorptions by DOAS fitting. Is the reference spectrum sensitive





to the ground surface, e.g. grass, water and concrete etc? I suggest adding more discussion.

Page 11886, first paragraph: For converting the SCD to VCD, the good weather conditions normally are choosed for simplifying the AMF calculation. I suggest adding sentences about suitable weather condition for the flight measurement.

Page 11885, line13: "Hence the results presented in Sect. 3 constitute lower limits of true troposphere SCDs". What is the meaning of "lower limits"?

Page 11886, section 3.1: It is better to have a table to list flight height, flight time, weather condition at each flight for easy reading. Is there any special concern about the flight track design?

Page 11887, line1-6: For the description of 2nd flight, there is no graph or data to support the text.

Page 11888, line 20: "The position of the stack in Fig. 11 is determined based on the method described in Sect. 2.2". There is no clear relevant description in Sect. 2.2.

Minor corrections:

Page 11890, line 3: In the body text "the flight on 7 October 2006 in Fig. 14" whereas in Fig 14 caption "the averaged iDOAS column density data from 6 October 2006"

Fig 14: The text font size on the graph indicating locations is too small to see.

Interactive comment on Atmos. Chem. Phys. Discuss., 8, 11879, 2008.

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