

***Interactive comment on “Tropospheric NO<sub>2</sub> vertical column densities over Beijing: results of the first three-years of ground-based MAX-DOAS measurements (2008–2011) and satellite validation” by J. Z. Ma et al.***

**Anonymous Referee #2**

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this paper report the tropospheric NO<sub>2</sub> vertical column densities (VCDs) over Beijing based on ground-based Multi Axis Differential Optical Absorption Spectroscopy (MAX-DOAS), and analysis the results with satellite data. this work is helpful to know the trace gas over North China, and even their effect on climate. But major revised is needed before it is published, including:

1. The manuscript need to be refined further, including writing and photos;
2. How to define the tropospheric NO<sub>2</sub> VCD in this paper? by altitude or something

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else;

3.The variation of tropospheric NO<sub>2</sub> VCD is owing to variability of PBL(e.g. Fig.7 and 10). It is might be not reasonable, first there are no data of PBL in this manuscript; second the variation of PBL will not affect the NO<sub>2</sub> VCD, it can affect the ground NO<sub>2</sub> concentration. Therefore, further analysis is needed to explain the variation of NO<sub>2</sub> VCD;

4. About the aerosol shielding effect (part 3.6.2), the authors just make case study with AOD values, including 0, 0.1, 0.3, 0.5, 1.0, 2.0 and 3.0,why not use true values since it can be calculated based on satellite data?

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