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# ***Interactive comment on* “Estimates of free-tropospheric NO<sub>2</sub> and HCHO mixing ratios derived from high-altitude mountain MAX-DOAS observations in the mid-latitudes and tropics” by S. F. Schreier et al.**

## **Anonymous Referee #1**

Received and published: 30 November 2015

Title: Estimates of free-tropospheric NO<sub>2</sub> and HCHO mixing ratios derived from high-altitude mountain MAX-DOAS observations in the mid-latitudes and tropics Author(s): S.F. Schreier et al. MS No.: acp-2015-799 MS Type: Research article

In this work, MAX-DOAS data sets from observations at two mountain locations are analyzed to obtain NO<sub>2</sub> and HCHO mixing ratios in the free troposphere. The analysis is based on a modified geometrical approach proposed by Gomez et al. (AMT, doi: 10.5194/amt-7-3373-2014), which assumes a single scattering geometry and a scattering point altitude close to the instrument. The manuscript is well written and provides

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information on species that have been little studied. Especially the long period of time analyzed make this study interesting.

I recommend this manuscript for publication in ACP after minor revisions.

I have a few comments:

- The field of view of the instrument is not mentioned at all in the paper. This has to be taken into account specially when analyzing data from Pico Espejo.

-I think Fig. 1 does not add more information than the given in the text. It may be removed. Or, is there an estimation/equation to add?

- The symbol for degrees ( $^{\circ}$ ) by describing elevation angles is missing in this new version.

- Is there any reason why could be or should be BrO included in the HCHO analysis? (apart from the obvious one that BrO absorbs in this spectral range)

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Interactive comment on Atmos. Chem. Phys. Discuss., 15, 31781, 2015.

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