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# *Interactive comment on* "The First Evaluation of Formaldehyde Column Observations by Pandora Spectrometers during the KORUS-AQ Field Study" *by* Elena Spinei et al.

**Anonymous Referee #2**

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This manuscript describes and evaluates Pandora spectrometer HCHO observations at two locations during the KORUS-AQ campaign, making use of using co-located ground-level and flight-based HCHO measurements. The paper provides a useful reference for future evaluation of Pandora observations, and is suitable for AMT. I recommend publication after minor revisions. One general comment and a few specific comments are given below.

General comment:

The description of the ground-based measurement technique (Sections 2.2) is insufficient. The Hottle et al. (2009) reference is for the LIF technique, which was not used

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here. Please include a more relevant reference and a more detailed description. More information on the instrument accuracy should be included, similar to the discussion of the CAMS measurement (page 13, lines 5-8).

Specific comments:

Page 2, line 20: Is the absolute bias greater than 16%? The slope is 1.16, but given the positive intercept, I would expect the bias to be greater.

Page 3, line 20: Add more recent references for global HCHO inversions (e.g. Bauwens et al., 2016). Section 2: Please reference a figure which shows the two locations on a map. This could be figure 4 with a zoomed-out key.

Section 2.1: Please state the integration time.

Page 9, lines 6-11: Line 7 says fitting scenario can result in an error of +/- 10%, and line 10 says the SCDS varied by 20%. Please clarify/simplify.

Page 9, line 19: Add "totaling to 14%" here or elsewhere in this paragraph. Also, is the 9% error from the HCHO cross section itself should be noted somewhere in the text (not just the table). Page 9, line 23: If possible, please state if these errors are expected to be large or small in comparison with the other listed uncertainties in $\Delta$SCD.

Figure 4: Simplify x-axis notation (ppt x 10ˆ3 to ppb)

Page 30, final conclusion: It is worth noting here that the Pandora instrument performed about as well as an in-situ measurement combined with measured mixing layer heights (Table 3).

References: Bauwens, M., Stavrakou, T., Müller, J.-F., De Smedt, I., Van Roozen-dael, M., van der Werf, G. R., Wiedinmyer, C., Kaiser, J. W., Sindelarova, K., and Guenther, A.: Nine years of global hydrocarbon emissions based on source inversion of OMI formaldehyde observations, Atmos. Chem. Phys., 16, 10133-10158, https://doi.org/10.5194/acp-16-10133-2016, 2016.