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 #1

Received and published: 9 May 2018

The manuscript titled “The First Evaluation of Formaldehyde Column Observations by Pandora Spectrometers during the KORUS-AQ Field Study” by E. Spinei et al. describes the first evaluation of the direct-sun observations of HCHO conducted by Pandora instruments via coordinated ground-based and flight-based in-situ HCHO measurements. These concurrent measurements were conducted in May-June 2016, at two locations in South Korea, during KORUS-AQ study. The topic of the paper is appropriate for AMT. The paper is very thorough and well-written. I recommend it for publication after the minor comments outlined below are addressed.

1) Page 3, line 25 – consider adding this paper to references: Bryan N. Duncan, Yasuko Yoshida, Jennifer R. Olson, Sanford Sillman, Randall V. Martin, Yongtao Hug, Kenneth E. Pickering, Christian Retscher, Dale J. Allen, James H. Crawford (2010), Application of OMI observations to a space-based indicator of NOx and VOC controls on surface ozone formation, Atmospheric Environment, 44, 2213-2223, doi:10.1016/j.atmosenv.2010.03.010. 2) Page 4, line 6 – consider adding this paper to references: Olga Pikelnaya, Stephen C. Hurlock, Sebastian Trick, and Jochen Stutz (2007), Intercomparison of Multi-Axis and Long-Path DOAS Measurements in the Marine Boundary Layer, J. Geophys. Res., VOL. 112, D10S01, doi:10.1029/2006JD007727. 3) Page 6, line 7 – add reference for DOAS technique, e.g. Platt and Stutz (2008), Differential Optical Absorption Spectroscopy Principles and Applications, Springer, ISBN 978-3-540-75776-4. 4) Section 2.1.1 - Add an example of HCHO spectral retrieval. 5) Page 6, line 25 – Explain the rationale for selecting 4.3km for heff. 6) Page 11, line 8 – Define VMR, volume mixing ratio (VMR), and use consistently uppercase or lowercase for VMR throughout the paper. 7) Figure 4 – Identify both sites on panels (a) and (c) and add a horizontal scale. 8) Page 17, lines 13-14 – Can you comment if flight measurements are in support of your assumption that the most of HCHO column was located in the mixed-layer? 9) Page 22, line 1 – Add reference to Figure 9. 10) Page 23, line 12 – Define “good” agreement.