We thank all reviewers for their constructive comments, which helped to improve the paper. Below, we address all comments point-by-point.

Referee #3,

Dear authors,
this manuscript uses TCCON data from several stations but lacks the proper references to the TCCON dataset DOIs. Citing these is a requirement of the TCCON Data Use Policy. Luckily, this can still be fixed easily.
Instructions:
- Go to the TCCON data archive at https://tccondata.org/.
- Visit the pages of the TCCON stations that you used for your study.
- Look at the section "Cite this record as:". You can download the dataset DOI citation
in various formats - including the correct one for Copernicus Publications.
- These dataset DOI references should be included in your manuscript's list of references.
- Since you used data from several TCCON stations, I recommend adding a table that contains all the TCCON site names, locations and the citations (like "Wennberg et al., 2016" for Lamont) . This is easier than putting all the citations into the text.

- Note: some TCCON stations have several data releases (R1 etc.). Every release has a different DOI, so please make sure that you cite the dataset release that you actually used in your study. The DOI references are also included in the header of the TCCON netCDF files that you downloaded originally. However, the DOI metadata on the TCCON Data Archive is probably more up to date. Citing the TCCON dataset DOIs is essential for tracking the use of TCCON data. Running a TCCON station requires considerable funds and efforts by highly qualified personnel. Being able to track the use of their data is critical for most TCCON stations to continue operations.
Additional comments:
- in your acknowledgments, the URL of the TCCON Data Archive is wrong. The correct one is https://tccondata.org/.
Please fix these issues before the final version. Thanks!
Kind regards
Dietrich Feist

R1- Thanks for the suggestion. We now add a Table (see below) in the paper to cite all the TCCON references.

Table 4. List of TCCON stations used in the study

Stations	Latitude and Longitude	Reference
Sodankyla, Finland	(67.3N, 26.6E)	Kivi et al. (2014)
Bialystok, Poland	(53.2N, 23.0E)	Deutscher et al. (2015)
Bremen, Germany	(53.1N, 8.8E)	Notholt et al. (2014)
Karlsruhe, Germany	(49.1N, 8.4E)	Hase et al. (2015)
Park Falls, WI(USA)	(48.4N, 2.3E)	Wennberg et al. (2014)
Paris, France	(48.4N, 2.3E)	Te et al. (2014)
Orleans, France	(47.9N, 2.1E)	Warneke et al. (2014)
Rikubetsu, Japan	(43.4N, 143.7E)	Morino et al. (2016b)
Lamont, OK(USA)	(36.6N, 97.4W)	Wennberg et al. (2016)
Anmyeondo, Korea	(36.5N, 126.3E)	Goo et al. (2014)
Tsukuba, Japan	(36.0N, 140.1E)	Morino et al. (2016a)
Dryden, USA	(34.9N, 117.8W)	Iraci et al. (2016)
Saga, Japan	(33.2N, 130.2E)	Kawakami et al. (2014)
Darwin, Australia	(12.4S, 130.9E)	Griffith et al. (2014a)
Wollongong, Australia	(34.4S, 150.8E)	Griffith et al. (2014b)
Lauder, New Zealand	(45.0S, 169.6E)	Sherlock et al. (2014)