

General comments

This study presents the results of validating TROPES/CrIS carbon monoxide (CO) profiles against in-situ aircraft observations. The authors demonstrate the significance of high-resolution spaceborne CO observations and present a data quality assessment. In particular, Section 6 assists readers in how interpreting the TROPES/CrIS data in detail. This information is essential for users applying this data to their studies.

The manuscript fits the scope of the journal and is well written. I believe it can be more readable with a bit of clarification and elaboration. Therefore, I would recommend publishing this manuscript after minor revisions. Please see specific comments below.

Specific comments

- Section 1 (Introduction):
In general, more clarifications would be appreciated on the definitions of MUSES and TROPES. Although detailed information is given in Section 2, please consider elaborating briefly on the description of the two terms (i.e., MUSES and TROPICS) in Section 1. My main questions are: Is it correct that MUSES is the algorithm name and TROPES is the product name?
 - More specifically, on Lines 84–87:
 - (1) Please provide full names for the abbreviations MUSES and TROPES here. MUSES' full name is provided in Line 91, after its first appearance in Line 84. TROPES' full name is only given in the abstract or after the conclusion section.
 - (2) Please consider moving a part (or the entirety) of the descriptions of MUSES (Lines 99–106) and TROPES (Lines 94–98) above Line 84.
- Line 238: Please provide a definition of the quality flag used here.
- Lines 329–332 and 378–380: The fact that MOPITT shows different patterns is mentioned twice in this manuscript without describing the causes. Could you provide possible reasons (e.g., differences in instruments or algorithms)?
- Lines 458 and 507: The phrases “what we expect for an optimal estimation” (Line 458) and “the expected behavior for optimal estimation retrievals” (Line 507) sound vague. Please elaborate on these sentences.

Technical corrections

- Line 78: CO₂ → CO₂

- Lines 85, 197, and 452: Please remove a comma before a parenthesis when presenting a reference (e.g., Hegarty et al., (2022) → Hegarty et al. (2022)).
- Line 147: x → ×
- Line 188 and Table 1: How about replacing °E with °W since all longitude values are negative?
- Line 433: Fig. 10 → Figure 10
- Line 450: A period missing (differences As expected → differences. As expected)