In this contribution, the authors presented the first ground-based FTIR GHG observation data collected on Qinghai-Tibetan Plateau from a 20-day campaign and the inter-comparisons with in-situ measurements and satellite GHG products. This study fills an important gap in GHG observations over the Tibetan Plateau. The paper is well-structured and summarizes the key findings. While the core contribution is solid, the manuscript would benefit from revisions to improve clarity and strengthen certain aspects of the analysis.

Major comments

1. Calibration: The study employs standard GGG2020 retrieval procedures and X/O2 normalization. However, it remains unclear whether additional calibrations were implemented to account for the unique high-altitude environment at QOMS. The manuscript should address whether Instrument Line Shape (ILS) characterization was performed under high-altitude conditions. Since GGG2020 a priori profiles are based on GEOS-FPIT, which may not fully capture local thermodynamic conditions on the plateau, it would strengthen the analysis to discuss whether alternative data sources (e.g., radiosonde data or ERA5 reanalysis) were considered, and how sensitive the retrievals, particularly XCH4, are to such profile inputs in this setting.

2. Uncertainty: While the manuscript acknowledges limitations in GEOS-FPIT a priori profiles (Lines 156-162), a quantitative assessment of their impact is lacking. Given this study's contribution to satellite validation, it is recommended to include a comprehensive uncertainty analysis of the FTIR retrievals. Specifically, a decomposition of systematic and random error components — including contributions from spectroscopy, observation geometry, a priori dependence, and instrumental effects — would significantly enhance the robustness of the results and align with AMT community standards.

Minor comments

1. Timing: The campaign was conducted in May, but it remains unclear whether this timing was chosen based on specific meteorological conditions and seasonal patterns of greenhouse gas concentrations in the QTP region, or if it was mainly due to logistical constraints such as resource availability and research team schedules. This raises questions about the representativeness of the May observations - to what extent can the findings represent annual or seasonal variations in greenhouse gas concentrations? Could the authors comment on whether the GHG levels during this period are climatologically representative based on past in situ or model records, or whether they might reflect transient synoptic conditions? Are there any plans to conduct additional observations during other seasons to provide a more complete temporal coverage?

2. OCO-2 Distance (Line 132): The spatial representativeness of QOMS FTIR measurements, particularly when comparing with OCO-2 data at distances up to 500 km, requires further discussion. Has the spatial variability of XCO2/CH4 over the Tibetan Plateau been evaluated through regional modeling or high-resolution simulations? A discussion of potential spatial representativeness error would be helpful here.

3. Comparison to 6 sites (Line 164): The rationale for comparing QOMS to six mid-latitude urban/suburban TCCON sites is unclear. They are mostly urban or suburb sites while QOMS is far from anthropogenic sources. It could be imagined that the Xgas at QOMS is lower. Given QOMS is a remote high-altitude site, a more meaningful comparison may be with other background or mountain sites such as Izaña, which are more comparable in atmospheric conditions and anthropogenic influence.

4. 3 weeks (Line 196): The correlations between XCO2 and XCH4 are different in the

three weeks. Are they driven by different weather/chemical conditions? It would help to link these changes in correlation patterns with meteorological conditions, e.g., changes in wind direction or boundary layer dynamics.

5. in-situ VS TC (Line 230): The CH4 surface mole fraction is **averagely** 97 ppb larger than the XCH4, but Figure 5b appears to show contradictory patterns where surface measurements are lower than XCH4 in 7 of 12 days. Could the "97 ppb higher" represent the real difference? This discrepancy between the daily mean bias and daily value distribution may suggest that outliers or skewed distributions contributed disproportionately. A histogram or scatter plot of daily differences might clarify this.

Technical comments

Line 2: and contribute to ... → contributing to/and contributions to
Line 8: end → and
Line 17: Qomolongma→ Qomolangma
Line 227: mesurements → measurements
Line 328: OCO-3 → OCO-2
Line 366: CH4mole → CH4 mole
It is recommended to write out full form at first mention, e.g. "std".