Response to Editor
An eleven year record of XCO_2 estimates derived from GOSAT measurements using the NASA ACOS version 9 retrieval algorithm

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Thank you to the editor for the suggestions and comments. We appreciate your time and concern. We have addressed each enumerated point below. The original reviewer comment is given in black. Our reply is given in blue. Modifications to the manuscript text are given in red as needed.

1. Requirement: Please include DOI information for the data products, listed at lines 907 and following in v3 of the manuscript, also at the end of the abstract. ESSD requires same information in both locations. Some readers, attracted by title and abstract, will choose to go directly to download options. Done.

   The ACOS GOSAT v9 XCO_2 data are available on the NASA Goddard Earth Science Data and Information Services Center (GES-DISC) in both the per-orbit full format (https://doi.org/10.5067/OSGTIL9OV0PN) and in the per-day lite format (https://doi.org/10.5067/VWSABTO7ZII4). In addition, a new set of monthly super-lite files, containing only the most essential variables for each satellite observation, has been generated to provide entry level users with a light weight satellite product for initial exploration (CaltechDATA, https://orcid.org/0000-0003-1080-9922). The v9 ACOS Data User's Guide (DUG) describes best-use practices for the GOSAT data. The GOSAT v9 data set should be especially useful for studies of carbon cycle phenomena that span a full decade or more, and may serve as a useful complement to the shorter OCO-2 v10 data set, which begins in September 2014.

2. Suggestion: Consider a 'teaser' data product. The GES DISC provides excellent access, including temporal and geographic sub-setting options, to both (L2Std and L2Lite) data products, but full downloads of either one involve 150 to 220 GB. (TCCON data require additional separate download).) Many interested users, not on high-bandwidth networks, will find such file sizes forbidding. Each landing page includes an example (global 1-year) graphic. Please may I suggest a teaser file: a (geographically, temporally) small product that shows off your complete processing and analytical skills but that allows many users to download and evaluate before allocating time and resources for a full download. Many ESSD products, particularly those involving multi-year satellite records, use teaser products successfully. Ideally, a teaser carries its own DOI (mostly to protect you) and, like the data DOI, gets mentioned at end of the abstract as well as in a data availability section. Occasionally, teaser products reside at a separate data repository from the main data files, e.g. Zenodo. Some authors devote a few sentences or a short paragraph to explanation of the teaser. Having looked again at graphics in your manuscript, I make an additional suggestion: provide a teaser product consisting of global GOSAT

CO2 compared to TCCON for the time period MAM 2014? This time period lies within your overlap period so you can highlight v9 improvements vs. v7.3. (You can also include relevant TCCON obs?) A separate ESSD Special Issue on emissions and air quality (e.g. https://essd.copernicus.org/articles/special_issue1100.html) uses exactly that time period for global and regional products, in part to encourage data providers to share one product covering a mutually-agreed time period. Although focused on reactive gases, I see strong mutual benefit between that portion of the user community and your satellite-based expertise. Definitely consider a teaser; exact subset up to you.

This was an excellent suggestion, and we have generated a new ”teaser” product that we call the ”super-lite” files. It is aggregated on a monthly basis and contains only the bias corrected XCO_2 for the ”good” quality soundings, along with a hand full of necessary time and location variables. We agree that this will be a nice asset for early adopters of the GOSAT satellite record. The necessary citation is given in the Abstract as shown above, and in the Data Availability section at the end of the paper.