

## Responses to reviewer's comments. (Reviewer 1)

Ueyama, et al.

The JapanFlux2024 dataset for eddy covariance observations covering Japan and East Asia from 1990 to 2023

### Revisions are colored red.

*First let me thank the authors for the consideration of all the requests and suggestions. I clearly still think that this is a great dataset and step forward. I checked some of the new dataset and revised the description and I think there are still few aspects to improve before publishing the paper, in particular related to the confusion that this dataset can create respect to the standard FLUXNET collections.*

*I acknowledge that the authors have already done a lot in this direction (e.g. o the site codes, now perfectly aligned with the FLUXNET standards so that they can be used also in other contexts) but these are the points that I would like to have better defined and stressed in the manuscript and in the data:*

Thank you for your prompt review and valuable suggestions for improving the dataset. We have revised the dataset, including the file naming, and clarified the description of how the current dataset differs from the FLUXNET product. We believe that the revised dataset and manuscript meet the standards of ESSD and provide valuable resources for users, while ensuring no confusion with FLUXNET products.

*1) The data: the files are in a standard format, clear and well explained. However I still see a major source of confusion the use of a filename structure that is imitating the standard FLUXNET produced by ICOS, AmeriFlux and OzFlux (using the same code) but not following the same standard in the content. I agree that having a file will less variables can be useful but the name should avoid confusion for the users. You could use something like "ALLVARS" and "SELECTEDVARS", but please avoid FULLSET and SUBSET. This would be even more critical if at one point JapanFlux will decide to share data in the standard FLUXNET, where the files would have then the same exact name (but different content).*

We apologize for the incomplete revision regarding this issue in the previous version. Following the reviewer's suggestion, we have revised the file naming convention as follows:  
1) changing "FULLSET" to "ALLVARS," and 2) changing "SUBSET" to "COREVARS."

*2) The sentence on line 66 "The data is processed with the standard data processing methods employed by the FLUXNET community", repeated also in line 108 should mention that a "selection of the standard processing methods" have been used. At the same time, the same sentence at line 115-116 should be removed or changed, because the processing applied is fundamentally different (in a number of aspects, starting from the meaning and selection of the REF, the data QAQC, use of the bootstrapping for the uncertainty estimation, the EBC., how the ustar threshold were applied etc.) respect to the FLUXNET2015. In other words you should help the user to not get confused... In the current version, how a user would understand that the REF NEE in this dataset is completely different from the REF NEE in FLUXNET?*

Following the reviewer's suggestion, we have revised the sentences in **Lines 65-67**: "The data was processed **using selected standard methods from the FLUXNET community, with adaptations specific to the JapanFlux2024 dataset.**", and in **Lines 114-115**: "The JapanFlux2024 dataset is processed **using selected standard methods from the FLUXNET**

community, with adaptations specific to the JapanFlux2024 dataset.” In conclusion the sentence have also been revised in **Line 488**: as ” the dataset is processed in line with **reference to selected procedures from the FLUXNET standard dataset**”.

*3) Still on the same point, the sentence “although some modifications and simplifications were made” is where instead more details should be provided, starting from the fact that more freedom in the data cleaning was agreed for the PIs, to the difference in the uncertainty estimation, ustar filtering and energy balance closure evaluation. You should also mention clearly that while FUXNET2015 and what is now produced by ICOS and AmeriFlux is based on the ONEFlux code, this dataset is based on a different code.*

Following the reviewer's suggestion, we have added a sentence in **Lines 140-143**: “**The JapanFlux2024 dataset differs from datasets such as FLUXNET2015 in that it provided site principal investigators (PIs) with increased flexibility in data screening. When clear anomalies were identified, quality control procedures were applied by the management team in collaboration with the respective site PI.**”.

The different approach for  $u^*$  filtering was described, but following sentence has been added in **Lines 203-213**: “The  $u^*$  threshold was determined with 100 bootstrap replicates, where reference (original data obtained without using a bootstrapped sample), the 5th, 50th, and 95th percentiles of the estimated  $u^*$  threshold were used for subsequent data filtering, gap-filling, and flux partitioning. Here, the nighttime was defined as downward shortwave radiation  $< 10 \text{ W m}^{-2}$ , and was further confirmed using exact solar time at the site location. On the basis of the estimated  $u^*$  threshold, nighttime  $\text{CO}_2$  fluxes and/or NEE were eliminated. **This dataset does not include the estimation of NEE using the constant  $u^*$  threshold (CUT), nor the advanced uncertainty estimation provided with the \_REF suffix, as implemented in the ONEFLUX pipeline (Pastorello et al., 2020).** For urban sites, the threshold was generally not used for two reasons (e.g., Liu et al., 2012; Ueyama and Ando, 2016): 1) nighttime  $\text{CO}_2$  fluxes were not expected to correlate with air temperature, making it difficult to evaluate the correct  $u^*$  threshold, and 2) the surface layer was often unstable even at night. Consequently, the  $u^*$  filtering was not applied for highly urbanized sites (JP-Sac and JP-Kgu).”.

The difference approach for the energy balance correction was described in **Lines 225-227**: “In the data collected from the site teams, energy imbalance correction (Twine et al., 2000) was not applied for H and LE at any sites; thus, the gap-filled H and LE were not corrected for the energy balance closure.”.

*Basically, the fact that this important dataset is NOT compatible with the FLUXNET is not a problem in my opinion. The authors defined a product and its value is independent of the compatibility with other products. Presenting it as compatible while it is not is instead a problem that must be carefully avoided, because would impact users and future products.*

*I already signed the first review so the authors can contact me in case something is not clear of if they want to discuss specific points.*

*Dario Papale*

Thank you for your valuable feedback on the dataset and manuscript. In addition to the revisions mentioned above, we have also updated the coordinates for the sites CN-In5, CN-In6, CN-In8, and CN-In7. We believe that the ambiguities in the dataset and manuscript, which could lead to user confusion, especially regarding the differences with FLUXNET products, have been resolved, and that this product will now contribute to the community.