Response to Reviewer #1

We would like to thank the reviewer for taking the time to review our manuscript. We provide our point-by-point responses to the reviewer comments below.

Reviewer comments:

The paper submitted by Ukkola et al. "FluxnetLSM R package (v1.0): A community tool for processing FLUXNET data for use in land surface modelling" presents a tool for the transformation and processing of FLUXNET data in order to make them directly available for LSM. The motivation is for sure important for the promotion of use of multiple data streams in LSM validation. However, the work presented doesn't have any relevant innovative concept or proposal. In fact, despite the import and export functions, change of format to NETCDF, renaming and unit conversions and summary plots (all steps that I don't think limits the use of data in LSM), there are no real innovations. The gapfilling of the meteorological drivers that is proposed (section 2.4.3) is an important step where gaps not filled in the timeseries are merged with the ERA-Interim versions, including the creation of a quality indicator. This activity however, looking to the variables description in FLUXNET available at http://fluxnet.fluxdata.org/data/fluxnet2015-dataset/subset-data-product/, is already done in the FLUXNET product (e.g. from the table in the website TA_F = Air temperature, consolidated from TA_F_MDS and TA_ERA, TA_F_QC = Quality flag for TA_F 0 = measured; 1 = good quality gapfill; 2 = downscaled from ERA). For this reason the paper doesn't have the needed advances, novel concepts, ideas or tools to be considered for publication.

We agree that the gap-filling of meteorological data is an important step in processing eddy covariance data for use in LSMs. The reviewer is correct that the SUBSET product has been gap-filled using 'good-quality' statistical gap-filling and downscaled ERA-Interim data. However, as the FLUXNET documentation (http://fluxnet.fluxdata.org/data/fluxnet2015-dataset/subset-data-product/) states, the SUBSET product contains minimal data quality and uncertainty information. It is suitable for those looking for an off-the-shelf data product, but does not provide the advanced user with the full resources to produce a dataset fit for purpose. The FULLSET product contains additional quality control information for the statistical gap-filling method used in FLUXNET2015 (Reichstein et al., 2005) that is absent in the SUBSET collection. As such, it provides the user with the full flexibility to use statistical and ERA-Interim based gap-filling, as facilitated by our R package. An important advantage of our R package is also the possibility to customise the gap-filling methods and add new methods to suit the user's requirements and datasets in a fully citeable and reproducible framework. We will clarify this in the revised manuscript.

In our experience, the discontinuities, varying data quality and incompatible data standards are real challenges for using flux tower data in LSMs. As many of these limitations are often resolved on an *ad hoc* basis, this hinders the reproducibility and transparency of many LSM studies using eddy covariance data, leads to under-utilisation of these data and wasted effort. Our R package aims to overcome these challenges and create a community standard for processing flux tower datasets. The reviewer indicated that they do not consider these as the main limitations hindering the use of flux tower datasets in LSMs. Unfortunately they do not elaborate what these limitations are in their opinion and we are thus unable to address these reviewer concerns in more detail.

References:

Reichstein, M., Falge, E., Baldocchi, D., Papale, D., Aubinet, M., Berbigier, P., Bernhofer, C., Buchmann, N., Gilmanov, T., Granier, A., Grünwald, T., Havránková, K., Ilvesniemi, H., Janous, D., Knohl, A., Laurila, T., Lohila, A., Loustau, D., Matteucci, G., Meyers, T., Miglietta, F., Ourcival, J. M., Pumpanen, J., Rambal, S., Rotenberg, E., Sanz, M., Tenhunen, J., Seufert, G., Vaccari, F., Vesala, T., Yakir, D. and Valentini, R.: On the separation of net ecosystem exchange into assimilation and ecosystem respiration: Review and improved algorithm, Glob. Chang. Biol., 11, 1424–1439, doi:10.1111/j.1365-2486.2005.001002.x, 2005.