

## ***Interactive comment on “Multiple quality tests for analysing CO<sub>2</sub> fluxes in a beech temperate forest” by B. Longdoz et al.***

**B. Longdoz et al.**

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Referee Comment: The paper presents interesting features which are necessary (and urgent) to apply on eddy covariance data to make them more comparable across sites. Even though such tests are known for quite a long time already they are rarely used by the eddy covariance community. There is a clear need for such a paper. Anyhow the quality of the paper suffers from clarity caused by frequent usage of acronyms and weak English language (I recommend a native speaker to read through), statistics should be described more clearly.

Authors Answer: The manuscript has been corrected by a Native English speaker and the Section 2.5 has been modified with more details (like threshold value of probability to determine if a difference is significant) to be clearer

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Specific referee comments: R.C.: P4198, I2: 'the selection of...' what choice do you have? This is maybe not the correct word used

A.A.: The words 'selection of correct EC records' has been replaced by 'The decision to exclude an EC flux from a database' showing that is not a choice but a decision to accept or not a data

R.C.:P4198, I9: which 'filtering' do you mean, this is not clear here.

A.A.: It's a acceptance or rejection of the data. The word filtering has been replaced by rejection

R.C.:P4198, I12: which 'improvement', not clear here

A.A.: It corresponds to an visible increase of the goodness of the fit of the ecosystem respiration measurements with a dependence on soil temperature and water content when the tests are used to reject EC data. This explanation has been included in the MS

R.C.: P4198, I16-17: 'The application on large datasets such as CarboEurope and FLUXNET is necessary.'

A.A.: Proposition included in the MS

R.C.: P4199, I2: temperature is measured as well!

A.A.: Yes sonic temperature is also measured, this point has been added in the MS

R.C.: P4198, I22: the Falge et al paper deals only with gaps produced by power failures, malfunctioning, ustar filtering, not by additional data filtering, the word 'selection' is maybe not correct here

A.A.: The data gap filling method proposed by Falge et al. is not especially adapted for the tests presented in the MS but can be applied independently of the gap origin. Consequently, the words 'gaps produced by this data selection' have been replaced by

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'gaps existing in the dataset'

R.C.: P4200, I15: how was the roughness length determined, this value seems relatively low

A.A.: The value given is wrong (MS mistake). The roughness length determined with the logarithmic profile law using the near neutral period (stability parameter between -0.1 and 0.1) is 1.4m This is relatively low but not unrealistic in view of the very homogeneous canopy with 17m height trees. Anyway, as this information is not essential for the MS purpose, it has been suppressed.

R.C.: P4201, I16: u and v are not needed to calculate FC

A.A.: Yes, they have been suppressed in the text

R.C.: P4202, I9: what is 'a tolerable range'?

A.A.: The paragraph has been modified to explained how the threshold to decide to flag a data are determined

R.C.: P4207, I12-18: it is difficult to decide whether the scientific message is valid because of unclear sentences and abbreviations

A.A.: This part of the text has been modified to be clearer and some links toward the definition of the abbreviations have been included.

R.C.: P4213, I6: what do you mean with 'more important photosynthesis exchanges'?

A.A.: It's a more important GPP. The words 'photosynthesis exchanges'; have been replaced by 'GPP'

R.C.: P4213, I11-13: The systematic application of quality tests is not only a question that is legitimate. The statement at the end should be made more clear!

A.A.: The statement has been changed to say that systematic application of the tests is necessary

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R.C.: Figs 1-2 should rather show CO<sub>2</sub> concentrations instead of voltage

A.A.: It's done in the new version of the MS

R.C.: 1) Does the paper address relevant scientific questions within the scope of BG? Yes 2) Does the paper present novel concepts, ideas, tools, or data? Yes 3) Are substantial conclusions reached? To be made more clear

A.A.: The conclusion section has been modified following the suggestion of the referees

R.C.: 4) Are the scientific methods and assumptions valid and clearly outlined? No 5) Are the results sufficient to support the interpretations and conclusions? Should be enhanced

A.A.: The flag percentage of the different tests are computed on the same basis and now all presented together (see new Table 1). They can be compared, this allow a better interpretation of the results

R.C.: 6) Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? 7) Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes 8) Does the title clearly reflect the contents of the paper? Yes 9) Does the abstract provide a concise and complete summary? Should be improved

A.A.: The abstract has been improved following the suggestion of the referees

R.C.: 10) Is the overall presentation well structured and clear? 11) Is the language fluent and precise? NO

A.A.: The MS has been corrected by a native English speaker

R.C.: 12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? 13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? Several text parts have to be clarified

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A.A.: The propositions of the referees to obtain a clearer text have been included

R.C.: 14) Are the number and quality of references appropriate? Yes 15) Is the amount and quality of supplementary material appropriate?

R.C.: Technical corrections:

A.A.: All the technical corrections proposed have been included in the MS

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**BGD**

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