

Interactive comment on “New techniques for gap-filling and partitioning of H₂O and CO₂ eddy fluxes measured over forests in complex mountainous terrain” by Minseok Kang et al.

Anonymous Referee #1

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Dear Authors,

Authors present the new gap-filling and partitioning method of eddy covariance flux over a complex terrain. The methods were combined several previously proposed methods, and were applied to eddy covariance data at Korean forests. I appreciate the work, because FLUXNET community should solve the known problems that authors did. However, in terms of the scope of Biogeosciences journal, the topic is too specific for the eddy covariance technique. I recommend that further modification in terms of the generalization and clarification of the method, especially for the validation and parameterization. Thus, I decide the manuscript as published after the major revision.

C1

Major

Canopy interception model should be validated based on the hydrological measurements or a test data that is from observed data. Without the validation of the model, readers cannot verify the applicability of the model. Incorrect results, due to inappropriate model and/or parameterization, could bias the gap-filled evapotranspiration. Authors need to discuss further model validation. In addition to the validation issue, I cannot follow how authors determined the appropriate model parameters (S, k, n, and g0). If readers want to apply the proposed method, how they will determine the parameters? How is the parameter uncertainties propagate the gap-filled fluxes and partitioned fluxes?

Authors sometime compare the results from the different gap-filling methods or results from previous studies (e.g., Page 11 Lines 24-29). I am not sure which is better, although authors said that the proposed method was better than previous ones without a concrete evidence. Authors must show the additional data for supporting the validity of the method.

The applicability and limitation of this method to other sites, such as tropical forests and grasslands, could be useful for many readers. Currently, only parameter for the two sites were shown as a case study. Further generalization should be required.

Minor

Page 5 Line 27: (Jones, 1993, => (Jones, 1993),

Page 8 Line 26: What is the d statistics?

Fig. 4 : Missing years in x-axis.

Page 31 Line 12 : previous study <= need citation!

Fig. B1: Is this your data? Is the data for your sites or other forests? Further clarification in the caption and citation are required at least.

C2

C3