We very much appreciate the reviewer's critical yet constructive comments, allowing us to reassess and improve our manuscript. Please see the below for the authors' reply

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.

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?

Response: We fully agree with the reviewer's comments. We will revise the manuscript as follows.

(1) Add more detailed explanations how we can obtain the parameters from our field measurement (mainly from the flux tower) and introduce alternative ways (e.g., using MODIS product)

(2) Add a section for sensitivity analysis of the proposed method similarly to that from Shi et al. (2010), and identify the parameters which significantly affect the gap-filling and partitioning results.

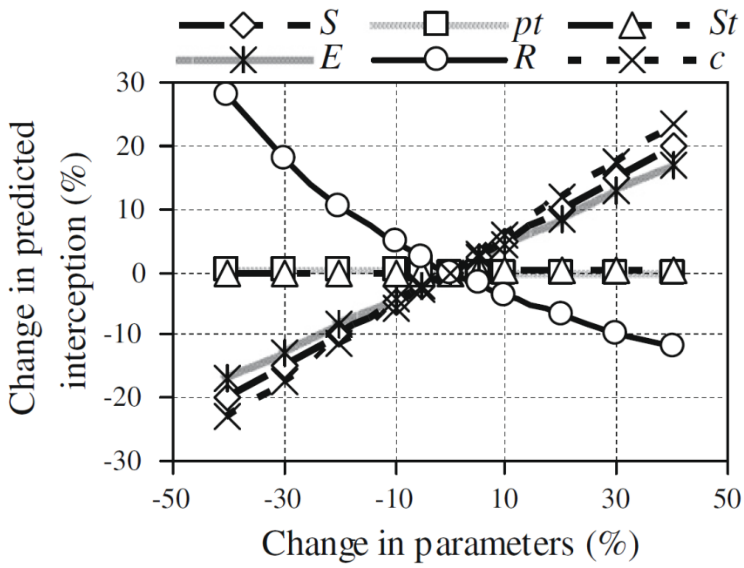

Fig. 1. Sensitivity analysis of the revised analytical model: influence of parameters *S* (canopy storage capacity), *c* (canopy cover), p_t (proportion of rain diverted to stem flow) and S_t (trunk storage capacity), and of climate variables *E* (mean evaporation rate during rainfall) and *R* (mean rainfall rate) (copied from Shi et al., 2010).

(3) Add a section for the (sensitive) parameters optimization. We should maximize the validity of (a small number of) the observed H_2O flux data under wet canopy condition. In the original manuscript, we used all available data under wet canopy condition to validate the method. In the revised manuscript, we will divide the available dataset into the datasets for parameter optimization and validation (i.e., validation after optimization). The ratio of the optimization-validation datasets may be 7:3. Such strategy can improve the applicability of the method (i.e., generalization).

Shi, Z., Wang, Y., Xu, L., Xiong, W., Yu, P., Gao, J. & Zhang, L. (2010) Fraction of incident rainfall within the canopy of a pure stand of Pinus armandii with revised Gash model in the Liupan Mountains of China. *Journal of Hydrology*, *385*, 44-50.

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.

Response: We agree with the reviewer's comment. The underestimation of the gap-filled H_2O flux under wet canopy condition from the conventional marginal distribution sampling (MDS) method has been shown by the comparison with the sum of energy flux components except latent heat flux (= net radiation + sensible heat flux + storage flux) in our previous study (Kang et al. 2012, the results from the proposed model-stats hybrid method (MSH) displayed the mirrored patterns of the sum of the other energy budget components, while the results from the MDS were ~ 0, see the below figure).

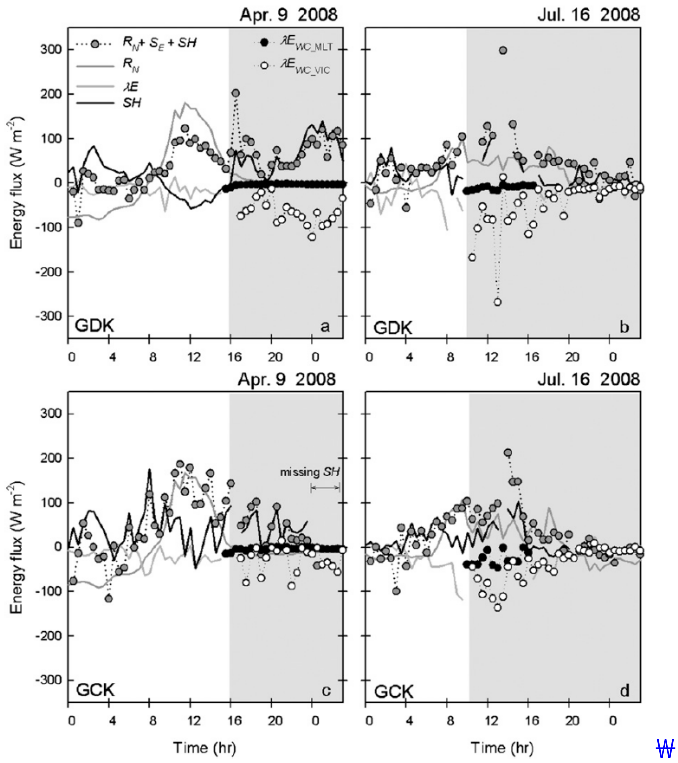

Fig. 2. Diurnal variation of net radiation (R_N), latent heat flux (λE), sensible heat flux (SH), the sum of three energy components (= R_N+ S_E + SH; where S_E, is energy storage), and wet canopy evaporation simulated by the modified lookup table method (λE_{WC_MLT}) and the algorithm of VIC LSM (λE_{WC_VIC}) at the GDK and the GCK sites. The shaded area represents the period of wet canopy condition. (copied Kang et al., 2012)

Based on the previous finding (i.e., Kang et al., 2012) and the validation results (section 3.1.1 in the manuscript), we argued that the proposed method was better.

The best evidence which supports the proposed method was better than previous one (i.e., in some year, rainfall increased evapotranspiration (it means that the increased wet canopy evaporation exceeded the decreased transpiration due to rainfall), and the underestimation of ET from the previous method especially in the summer of 2007 due to the unaccounted wet canopy evaporation) may be another actual (flux) measurement. If another actual measurement can be obtained easily, such gap-filling and partitioning would not be a scientific issue. Fortunately, there was the previous study which reported the runoff from the forest catchment (Choi et al. 2011).

We will revise the manuscript as follows.

(1) Add the paragraph which explains that the conventional gap-filling method underestimates H_2O flux under wet canopy condition (i.e., a more detailed summary of our previous study, Kang et al., 2012).

(2) Add the sentences which can support the proposed method was better than previous one (e.g., Page 11 Lines 24-29): (1) the ratio of the runoff and the precipitation (adapted from Choi et al. 2011) in 2007 was the lowest (0.60 in 2007, 0.69±0.06 in the other years, i.e., the ratio of the ET to the precipitation can be the highest), while the global radiation (main controlling factor of transpiration) was the lowest (4.52 GJ m^{-2} in 2007, 4.77±0.08 GJ m^{-2} in the other years) due to the longest rainfall duration, (2) it was identified that the interannual variabilities of the estimated catchment scale annual ET (i.e., precipitation – runoff) and ET from the MDS method occurred in opposite directions (similarly to transpiration from the MHS method).

Kang, M., Kwon, H., Cheon, J. H., & Kim, J. (2012). On estimating wet canopy evaporation from deciduous and coniferous forests in the Asian monsoon climate. *Journal of Hydrometeorology*, *13*(3), 950-965.

Choi, H. T. (2011). Effect of Forest Growth and Thinning on the Long-term Water Balance in a Coniferous Forest. *Korean Journal of Agricultural and Forest Meteorology*, *13*(4), 157-164.

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.

Response: We think the generalization of the method can be augmented by providing the parameter optimization procedure using available flux data under wet canopy condition. We also argue that this is better than the validation using other datasets because the parameters may be site specific (i.e., more validation does not fully guarantee the proposed method works properly everywhere). The proposed method can be applied to tropical forests because tropical forests also share three properties of temperate forests (i.e., extensive, dense, and tall). However, applying the methods to grasslands may need further validation. We will mention these in the manuscript.

Minor

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

Response: We will correct as suggested.

Page 8 Line 26: What is the d statistics?

Response: The index of agreements (*d*; Willmott, 1982) is defined as follows:

$$d = 1 - \left[\frac{\sum_{i=1}^{N} (Y_{\mathrm{est}_i} - Y_{\mathrm{obs}_i})^2}{\sum_{i=1}^{N} (|Y_{\mathrm{est}_i}{}'| + |Y_{\mathrm{obs}_i}{}'|)^2} \right]$$

where $Y_{\mathrm{est}_i}{}' = Y_{\mathrm{est}_i} - \overline{Y_{\mathrm{obs}}}$ and $Y_{\mathrm{obs}_i}{}' = Y_{\mathrm{obs}_i} - \overline{Y_{\mathrm{obs}}}$ (where the overbar is an averaging operator). The index ranges from 0 to 1, where 0 represents a complete disagreement, and 1 represents the complete agreement between the observation and the estimates. This index is both a relative and bounded measure that can be widely applied to make cross-comparisons between models.

We will add a section for the error assessment. In the section, we will define each error assessment term mathematically as above.

Fig. 4 : Missing years in x-axis.

Response: We will correct as suggested.

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

Response: We already provided the citations in Table B1.

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.

Response: We already provided the citations in Table B1. We will modify the caption to avoid such confusion.