

Interactive comment on “Net ecosystem exchange of carbon dioxide and water of far eastern Siberian Larch (*Larix dahurica*) on permafrost” by A. J. Dolman et al.

Anonymous Referee #2

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The paper is original since only few studies has been published on Siberian forests carbon exchanges and particularly only one on larch forest, despite this biome is one of the most representative of the East Siberian landscape. There is no doubt that these data are important and the major finding of the paper, that maximum carbon uptake rates are greater than previously reported in short term campaigns is important. However I see a weak point in the paper in addressing data treatment, particularly storage fluxes, and some inconsistencies in the text.

Storage fluxes have not directly measured by the authors. Some corrections have applied to night time fluxes for the storage term. However storage fluxes are needed not only for nigh time fluxes corrections but overall day and night to estimates hourly flux rates. Since one of the major message of the paper is about rates of carbon uptake some care and more in depth discussion of the implication of missing of storage fluxes is needed. For example : 1. Is storage flux important during the day ? 2. What are

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the general stability and u^* statistics ? 3. Why not using changes in reference height concentration to estimate storage flux ? 4. Are the maximum CO₂ rates occurring during stability breaking ? (to show a classical diurnal trend would be helpful) It is important to show in a more convincing way that the basic results of higher rates of carbon fluxes are not an artifact of the missing storage flux measurements. I also would suggest to use the changes in concentration at the reference height, although not perfect it can be a reasonable approximation to the storage flux. It was rather unclear to me the second method for night time flux correction, may be a better explanation is needed, or using a graph to show how it works.

I found some inconsistencies on page 284 where annual uptakes are presented as 12 to 17.7 g C m⁻². Later data are presented also in mol C m⁻². I would use the same unit throughout the text.

Overall I think the paper is publishable if the issue raised on storage flux can be better clarified.

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