

## ***Interactive comment on “Underestimated effects of low temperature during early growing season on carbon sequestration of a subtropical coniferous plantation” by W.-J. Zhang et al.***

**Anonymous Referee #2**

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The authors discuss an aspect of the sensitivity of CO<sub>2</sub> budget components regarding air temperature. This low temperature effect on carbon sequestration is worth mentioning for a subtropic site besides other steering variables like water availability. So, this manuscript is appropriate for the journal. However, I have methodical concerns about the applied procedure concerning data processing and interpretation. The measurement setup consists of an open-path gas analyzer among others. This analyzer generates data gaps during the frequent wet conditions (dew, precipitation) at this site resulting in a high data gap frequency of 50–60% which is further increased due to the necessary quality controls. The authors are aware of this bad data situation. To produce long-term budgets of CO<sub>2</sub> flux components established gap filling procedures

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have been used. I want to know the data base (measured values) to parameterise the non-linear relationship especially between nighttime CO<sub>2</sub> flux and soil temperature/soil moisture which is the basis for gap filling. Are the fitted parameters dependent on data availability? Furthermore, what is the influence of the application of gap filling procedures on the carbon budgets? The authors could check this by producing artificial data gaps. A critical  $u^*$  value of 0.19ms<sup>-1</sup> was used for the whole period 2003–2008 but this value can vary from year to year. Is that the case? What is the influence on the RE and GEP budgets? The main topic of this study is the low temperature effect during early growing season on carbon sequestration. Is this effect maybe a radiation effect due to a cross-correlation between temperature and radiation? To avoid this conclusion the authors should check the influence of the early growing season temperature on the carbon budget normalised with radiation (not only on carbon budget itself). Finally, the authors should ask themselves whether this study is mainly based on measurements or is it more a modelling paper.

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