***Interactive comment on* "How past fire disturbances have contributed to the current carbon balance of boreal ecosystems?" *by* C. Yue et al.**

Anonymous Referee #2

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Yue et al.: How past fire disturbances have contributed to the current carbon balance budget of boreal ecosystems?

The contribution of fire disturbance to the current carbon balance have been estimated using ORCHIDEE-SPITFIRE simulations. Overall the authors conclude that fires form a net carbon sink of 0.06 PgC/year, which is 6% of the regional carbon sink. This is an important finding, and a highly relevant topic for Biogeosciences. The manuscript is extremely well written and structured. The method are clearly described and the shortcomings of the ORCHIDEE-SPITFIRE model are discussed in much detail based on model data comparison as well as comparison to previous studies. I recommend publication with some minor modifications (see below).

[Response] We thank the reviewer for the valuable comments. Please find our detailed responses below each comment in blue. All the modified texts are marked as red in the revised texts, with big blocks of deleted texts being marked using the "edit" mode, to make it easy to follow which parts of texts have been modified in reponse to review comments.

Title: This is actually not the question – you might want to remove the ?

We think it's OK to use a question as a title, making the title more interesting and is actually the exact question we want to answer in the manuscript.

Page 14839, Line 25: intensive?

We changed "intensive" to "area-based" to be more clear.

Page14840, Line 3: As it is written now the 2nd part is the sum of all contributions.

If you mean the 2nd part of the right side of Equation (2) is the sum of all decadal fire contribtuions, we agree.

Page 14841, Line15,: Couldn't equation 2-4 already use NBP?

Not yet, we tried to use "carbon flux" or "carbon balance" exclusively in these equations. On Line 15 here we define specifically what NBP means in the context of our model and this study.