

## ***Interactive comment on “Nitrogen deposition: how important is it for global terrestrial carbon uptake?” by G. Bala et al.***

**G. Bala et al.**

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Short comment:

I like the idea that this paper is trying to quantify the effects on carbon storage from CO<sub>2</sub>, T and Nitrogen. The feedback metrics are appropriate for this. I think it's important to show there are some quite strong non-linearities/interactions between the forcings. Especially (and not surprisingly), the role of N-limitation is greater under higher CO<sub>2</sub> than 1xCO<sub>2</sub>. Your results are already sufficient to show this (it's clear in the figures and tables), but the text does not put much emphasis on it. Perhaps you could add some more around this. e.g. what does it mean to quantify your new feedback metric "delta" when the value of this depends on the CO<sub>2</sub> level? do we also need feedback metrics for the cross-terms? implications for the future projections are that

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the role of N will vary depending on the CO<sub>2</sub> level (e.g. it may be more important under RCP8.5 than under RCP2.6 perhaps?)

Response:

We thank Chris Jones for his comments and suggestions on the non-linearities and their implications. In the revised manuscript, as suggested by the reviewer, we elaborate the discussion on Table S3: we now write that the nonlinear interaction term has a magnitude of about 10%. Further we add “These nonlinear interactions would suggest that the role of N deposition will vary in the future depending on climate change and the CO<sub>2</sub> levels. For instance, the interaction term may be more important under a higher emission scenario such as RCP8.5 (Representative Concentration Pathway 8.5) than under RCP2.6”

Also, in response to referee #2's comments, we have added a paragraph in the last section where we discuss the interaction terms.

Note: Attached the full revised manuscript(Click the link below) as a supplement to this comment.

Please also note the supplement to this comment:

<http://www.biogeosciences-discuss.net/10/C5704/2013/bgd-10-C5704-2013-supplement.pdf>

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