

## ***Interactive comment on “Soil CO<sub>2</sub> efflux from two mountain forests in the Eastern Himalayas Bhutan: components and controls” by Norbu Wangdi et al.***

**Anonymous Referee #1**

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General comments

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This manuscript describes measurements of soil respiration (Rs) made in the field in two forests in Bhutan, supplemented by laboratory incubations, that looks at Rs fluxes, sources, seasonally-driven changes, as well as sensitivities to temperature and moisture. This is interesting and valuable, given the paucity of data from this region, if not groundbreaking. The ms is reasonably well written, although there are many minor English errors, and frequently insightful. I particularly liked the comparison between different techniques and measurements/models, even though this is not developed as fully as it could be.

C1

There are some problems. Aspects of the methods and results are unclear; in particular, the authors should be careful to distinguish between measured and modeled results, why and when each was performed, and when they're referring to each. I think the trenched plot results could be better discussed, particularly as the problems that occurred seem relatively straightforward to explain. Finally, and very importantly, the authors need in my opinion to post or include the data and code backing all their main results (see #9 below).

In summary, this ms needs moderate to significant revisions in many places, but it's fundamentally a strong and interesting study.

Specific comments

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1. Lines 23-24: why does a discrepancy between modeled and measured Ra indicate trenching performed poorly? Clarify. Might also add “, probably because of the short time lag between trenching and measurement”?
2. L. 27: “preceding” ?
3. L. 37: maybe “potentially feeds back on global climate change”. Also there are better citations for this, e.g. Frey et al. 2013 (10.1038/nclimate1796) or Wang et al. 2014 (10.1111/gcb.12620)
4. L. 50: start a new paragraph
5. L. 67: “would show decreases in Rs during”
6. L. 118-: what was delay between trenching and starting measurements?
7. L. 172: better to say “Effects of site” rather than “forest type” since you can't actually test forest type (as n=1)
8. L. 190: perhaps “to calculate a projected daily field Rs” for clarity

C2

9. Availability of code and data? It's 2016, and I expect all code and data (at least that backing the main results) to be included as supplementary info, or posted in a repository. It's not acceptable to produce results from a black box 10. L. 252-257: interesting!

11. L. 278: "any meaningful Rh values"?

12. L. 310: "Q10 tends"; also should be "increase with decreasing temperatures"?

13. L. 314: "than the ones"

14. L. 327: "We intend to"

15. L. 333: this is awkward English and unclear – why "ambivalent"?

16. L. 338: "Rs, falling well within"

17. L. 345: "albeit"? What?

18. L. 348-353: interesting though unsurprising. Might mention this in abstract

19. Figure 1: minor point but perhaps format x axis dates as "Apr 2014", "May 2014", or something like that to eliminate M/D/Y ambiguity (i.e. make consistent with Figures 4 and 5)

20. Figure 3: necessary?

21. Figure 4: this is confusing. At the very least, clarify the caption, and perhaps re-think how these data are displayed

22. Figure 5: perhaps note in caption that the Rh lines are cumulative

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