

Interactive comment on “Recurrent winter warming pulses enhance nitrogen cycling and soil biotic activity in temperate heathland and grassland mesocosms” by J. Schuerings et al.

Anonymous Referee #2

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General comments: The manuscript entitled “Recurrent winter warming pulses enhance nitrogen cycling and soil biotic activity in temperate heathland and grassland mesocosms” by Jentsch et al. reports the interesting results about the context (i.e., vegetation type, habitat abiotic environment) dependency of the effect of extreme warming pulse on plant-soil systems. Overall, the manuscript is well-written. On the other hand, with the plenty of data that the authors have, to avoid the speculative discussion, it can be once choice to clarify the mechanism through which, for instance, the available N increase, by conducting the linear mixed model by setting several factors as explanatory variable (e.g. enzyme activity, plant N uptake. . .) and doing N availability as response variable. Furthermore, the number of zero-crossing in soil temperature is

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helpful to have the implication about the effects of soil FTC on the tested parameters.

Specific comments: P7799-Line 7: Why “However”? And I think “soil freeze-thaw cycles” would be proper here because, for example, Joseph and Henry (2008) study not the effect of thawing solely but that of freeze-thaw.

P7799 Line 7-9: This part can be moved to the second paragraph where soil FTC is described. But please be sure that line 25-26 is overlapping with this sentence.

P7800 Line 7: Please add short explanation about why the grasses are more responsive than shrub.

P7800 Line 13: Add “of” just after “the effects”

P7800 Line 11-12: This can be deleted because this information is not necessary to draw the hypothesis.

P7801 Line 10: N could be E.

P7809 Line 11: How about the possibility that the increase of N availability is caused by the reduction of N incorporation by pulse treatment? It is nice to move a part of P7810 Line 4-19 to this part.

P7809 Line 21-22: I could not catch what the authors wanted to mention with this sentence. Please re-word.

P7810 Line 10: Please insert “directly” between “damage” and “plants”.

P7811 Line 2: It is nice to mention the importance of functional trait-based study to clarify the determinant of species specific response. Please read Cornelissen and Makoto (2014) Winter climate change, plant traits and nutrient and carbon cycling in cold biomes Ecological Research (DOI 10.1007/s11284-013-1106-1).

P7811: Line 15: Here Makoto et al. (2014) Winter climate change in plant-soil systems: summary of recent findings and future perspectives Ecological Research DOI:

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10.1007/s11284-013-1115-0 pr

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