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Biogeosciences Discussions

Interactive comment on "Contribution of root and rhizosphere respiration to the annual variation of carbon balance of a boreal Scots pine forest" *by* J. F. J. Korhonen et al.

Anonymous Referee #1

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General comments: This paper presents results of a girdling experiment to study the components of total respiration in a boreal forest ecosystem. There are interesting findings, however, there are also some weaknesses in this study e.g. the differences in the background respiration values between the control and treatment, long sampling intervals and also a relatively small study plot without any replicate plots. Furthermore, lot of scaling and assumptions are made in the calculations. The quality of this paper could still be improved. The text could be compacted and the language could benefit checking.

Specific comments:

Abstract: -Line 5: please specify "breast height" -Line 10: please specify Rd -Lines 7-9: Is this scaling needed in the abstract -Line 15: was GPP significantly risen in winter?

Methods -Page 6183, lines 10 & 17 Please specify "breast height" -Page 6183, line 14. How far from the girdled plot was this SMEAR II station, was it the control plot? -Page 6183, lines 16-17. Could you shortly describe the Granier method (and give the results in results chapter). The reference (Granier et al. 1985) is in French. -Page 6183, line 26, give the dimensions of the chambers, were they similar as in control plots (page 6184, line 12)? -Girdling was done on 18 June, how fast does it affect? And how did you take in account the time lag? -Page 6183, line 15, which data was recorded? -Page 6184, lines 4-6. If the CO2 flux was not linear, why did you exclude the first measurements and made it to be linear? See: CO2 flux determination by closed-chamber methods can be seriously biased by inappropriate application of linear regression. Kutzbach L, Schneider J, Sachs T, et al. BIOGEOSCIENCES 4: 1005-1025, 2007

Results -Page 6187, lines 13-14. What does this mean, monthly values from measurements? Why? The measurements were made only in the mornings (Page 6183, line 23) Respiration rates have diurnal dynamics. -Page 6187, lines 26-27. What is this Hyytiälä forest, is this SMEAR II station, is it the control plot in Hyytiälä forest? (at the moment reference Kolari et al. 2009 is not found online from Boreal Environment Research) -Page 6188, line 4: Annual Rr and Rd in control plots? which periods? -Page 6188, line 11-13: Did you test it also later in the following year? Could you show the results?

Discussion -Page 6190. lines 3-4. Could this be a result of a small girdling plot in your study? -Page 6193, lines 28-29. If there were no annual trend in the total ecosystem respiration, was it then similar throughout the year?

Acknowledgements: -Line 17 It is "Maj and Tor Nessling foundation. . ."

References: -Kolari P et al. (2009) CO2 exchange. . . and Ilvesniemi et al. (2009) were

not found online in Boreal Environment Research - Lloyd and Taylor (1994) is missing from the reference list

Figures: -Figure.1 Where are the control plot and collars? -Figures. 2 and 3. Could you combine these two figures and use the same scale for x-axis? -Figure 4. The bars start from negative values, this can be confusing. The bars should start from 0 and the negative values should be downwards from 0. Why do you use here only measured, not modeled values? -Figure 5. The measured Rr values during winter are clearly lower than the modeled values. Could you just use the measured, not modeled values for the winter period? Show also GPP here, the GPP results are used for calculating ratios but they are not shown.

Interactive comment on Biogeosciences Discuss., 6, 6179, 2009.