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Discussions
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Interactive comment on "Responses of soil microbial communities and enzyme activities to nitrogen and phosphorus additions in Chinese fir plantations of subtropical China" *by* W. Y. Dong et al.

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Comments in response to Referee 1

This manuscript is well written. It is easy to read and provide interesting results on how nutrient additions affect microbial composition and activities in Chinese fir plantations. Here I only have several small questions. Response: We would like to thank you for the helpful and constructive comments, which further improved the manuscript. We have carefully revised our manuscript to take account of your comments and sugges-

tions. Please find below our responses to comments (repeated in an italic font). The page and line numbers mentioned here refer to the latest revision of our manuscript simultaneously submitted with all figures as a single PDF file.

(1) The authors should well explain why they use PLFAs to represent microbial composition in introduction and what PLFAs can tell us. Response: Phospholipid fatty acids (PLFA) are major cell membrane constituents, and their polar head groups and ester-linked side chains (i.e. FAs) vary in composition between eukaryotes and prokaryotes, as well as among many prokaryotic groups. These compounds rapidly degrade upon cell death, making them good indicators of living organisms. Therefore, their presence represents the'living' or active component of the microbial community. We have supplemented the function of the PLFA analysis on P2, L31 to P3, L9 as follows:" Phospholipid fatty acids (PLFAs) are a vital component of the cell membrane (essentially the skin) of all microbes, and their polar head groups and ester-linked side chains (i.e. FAs) vary in compositions between eukaryotes and prokaryotes, as well as among many prokaryotic groups (Drenovsky et al., 2004). These compounds rapidly degrade as cells die, making them good indicators of living organisms(Zelles, 1999).Therefore, PLFAs representing the'living' or active component of the microbial community. PLFAs analysis allows differentiation of the microbial community composition and microbial biomass of each group quantitatively."

(2) Regarding explanation why there was a seasonal effect on enzyme activities. Response: Thank you for the suggestions,we have added the explanation on P11, L32 to P12, L11 as follows:" Our results clearly demonstrate that the two-season investigated micros (July and November) differed in their functional responses to nutrient additions. The microbes demonstrated a higher capacity to degrade substrates (cellulose, plant cell walls) in November than in July, as indicated by the enhanced ïĄćG, NAG and aP activities. This was due to the higher SMC in November, which was significantly and positively correlated with soil enzyme activities in the present study (Table3). Similar results have been observed previously for other tropical forest sites, in which they con-

sidered that low soil moisture would strongly limit soil enzyme activities (Liu et al., 2012; Steinweg et al., 2012; Schaeffer et al., 2013). Furthermore, McDaniel (2013) found that simulated warming decreased both soil ïĄćG and NAG enzyme acitivities by 19 % and 21 %, respectively. In our study, the mean temperature in July was close to 30°C, which might suggest that the soil enzyme activity was inhibited by high temperature in July than in November (Fig.1)."

(3) Table 1-2, please specify these abbreviations. These descriptions seem contradictory, please check them. After these minor revision, I suggest that it can be accepted to publish. Response: Revised as recommended.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/12/C4349/2015/bgd-12-C4349-2015-supplement.zip

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