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Biogeosciences Discussions

Interactive comment on "Pathway of CH_4 production, fraction of CH_4 oxidized, and ^{13}C isotope fractionation in a straw incorporated rice field" *by* G. B. Zhang et al.

Anonymous Referee #1

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This paper contains a lot of interesting data on methane production and oxidation and transport processes. I agree mostly with the author's explanation. One comment however I would like to point out is about the interpretation for the change in delta value before and after cutting. The authors described that reasons for this difference may be related to the decrease in growth of the rice crop as a result of straw incorporation in the abstract, however I do not think it is explaining the reason. I do not understand why smaller rice plant derives larger fractionation. I recommend the authors to revise this part. Transport of CH4 is basicaly diffusion process. Small difference in condition may cause a difference in isotope fluxes. Pressure and partial pressure in the rhizosphere may be higher in WS, and delta value of CH4 in the soil was also higher

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in WS. Those differences in physical condition may also cause the difference in the fractionation. These processes have not yet fully understood because of difficulty of experimental procedure. Therefore, I recommend the authors to describe that the processes to cause the difference are not fully understood however differences in physical conditions such as pressure in rhizosphere and plant size may affect the diffusion process and as a result εtransport change.

Interactive comment on Biogeosciences Discuss., 9, 14175, 2012.