Comments on Zhong et al. for Biogeosciences Discussion

This manuscript presents an interesting study on the response of an alpine grassland ecosystem to warming and grazing in the period of 10 years. N2O production via variable microbial components was the main focus. It is written concisely and easy to understand. However, regarding the experiment design and interpretation of the dataset, I believe that there is still more to improve before it could be published. Despite their investigation into multiple treatments and parameters, the authors need to provide more field evidence and literature comparison to reach a convincing conclusion.

Throughout the whole manuscript, the authors seem to mix up denitrification enzymatic activity and N2O production. If the inhibitors applied in the experiments to determine denitrification rates also inhibit N2O reduction to N2, the N2O production should rather represent potential denitrification rates. If N2O reduction was not inhibited during the experiment, the results could not be noted as "denitrification rates". Please clarify this key point and make revision accordingly. The methods determining these rates should be described in more details in M&M.

Line 111: "To clarify whether fungi control the N2O production process" is misleading as Fungi contributes anyway; I assume that the authors wish to clarify the "role of fungi in N2O production process"

Line 161-162: Please explain this; why do you see the effects on ecosystem level despite that plot size are 3 m? Any data to support this?

Line 165: If 10 years' warming and grazing treatment was done, why was only one sampling of soils by the end of 10 years' treatment? Have you considered the soil heterogeneity between control and treatment plots since the beginning of treatments?

Line 166: Including or excluding organic layer? Please specify.

Line 225-226: 100% of water-holding capacity could favor denitrification; however, it may not likely represent field condition, which is usually drier. Please justify your choice of such incubation condition.

Line 294-298: Use present tense: use "is" to replace "was".

Line 298: Change "who" to "whom".

Lne 314 to 315: When comparing the studied alpine grassland to temperate grassland, how do come to to the conclusion that the lower inorganic C and N contents in soil were due to larger fungal contribution to N2O production? What about the higher mineralization rates in the temperate systems? In addition, the control of inorganic C or N levels in soil could be also related to biomass uptake and turnover. Please clarify it and avoid such speculation.

Line 324: "common" and "globally" do not fit together; please revise.

Line 348-349: "gene abundance of fungi was not changed" against treatments; how do you reconcile your finding with the hypothesis?