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Comment

***Interactive comment on “Effects of free-air CO<sub>2</sub> enrichment (FACE) and soil warming on CH<sub>4</sub> emission from a rice paddy field: impact assessment and stoichiometric evaluation” by T. Tokida et al.***

**Anonymous Referee #1**

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Comments:

CH<sub>4</sub> production in the paddy field is an microbial-involved biochemical process which is driven by substrate availability and redox potential. The authors did not find significant effect of elevated CO<sub>2</sub> on CH<sub>4</sub> emission, which is quite different from that of Xu et al. as the authors mentioned in the text. The SOC contents in current paper and in Xu et al. are 77.8 g kg<sup>-1</sup> and 14.9 g kg<sup>-1</sup>, respectively. Supposing the enhancement of rice growth to elevated CO<sub>2</sub> is the same, due to the the higher SOC availability in current experiment, the enhancement of CH<sub>4</sub> emission should be much smaller than that of

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Xu et al. Indeed the authors' results are the case.

The large CH<sub>4</sub> emission difference between ET and NT is just the reflection that higher temperature lead to higher decomposition of SOC and then lead to higher CH<sub>4</sub> emission. I don't think the calculation of SOM decomposition by N mineralization in situ can reflect the real SOM decomposition.

As for the relevance of Fe reduction and CH<sub>4</sub> emission, it is a worthy topic to be studied further.

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Interactive comment on Biogeosciences Discuss., 7, 1863, 2010.

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