

Interactive comment on “How methane emission from rice paddy is affected by management practices and region?” by Jinyang Wang et al.

Anonymous Referee #1

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General comments Rice agriculture is an important source of atmospheric methane (CH₄). The estimations of CH₄ emission from rice fields on a national or global scale have been relatively well documented by using the inventory-based methods or model-based approaches. Due to more and more field measurements of CH₄ emission were available from the monsoon Asian countries and the rest of the world in last ten years, the effect of various factors (management practices like water management, nitrogen (N) fertilizer use, organic input and rice varieties, etc.) on CH₄ emission from rice fields would be different in statistics from previous reports. However, no information is available on this issue in global scale. The authors updated the dataset from monsoon Asian countries as described previously (Yan et al., 2005) to over the world (1089 measurements from 122 rice fields across the world) in this study. They reassessed

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the impacts of major variables controlling CH₄ emission from rice fields and found that water management and organic fertilizer application were the top two controlling variables. They developed the region- and country-specific emission factors and also estimated the default EFs at regional and country levels. Overall, the topic of this work was very important and timely to gain an insight into CH₄ emission inventory, which would help to assess regional and national agricultural CH₄ budget with low uncertainties. Good job! The manuscript was well written too. I recommend this work to be acceptable after minor revisions for publication in Atmospheric Chemistry and Physics.

Minor comments 1. Abstract Please give more information (e.g., EFs or SFs) about the CH₄ emission as affected by the region. In other words, the authors should pay much more attention to the regional CH₄ emission or emission factors (EFs) besides the management practices. 2. Materials and Methods - Please show the units for all dependent and independent variables in Eqns (1) and (2). - How to quantify the pre-season water status (PW) and water regime (WR) in Eqns (1) and (2)? - What's the difference between OM and AOM in Eqn (1)? - It's hard to figure out what the climate variables are. Do the agroecological zones (AEZ) represent climates? If no climate variables were involved in these two equations, I would suggest deleting the CL but showing AEZ. 3. Results and Discussion - Suggest changing '3.3 Development of region- or country-specific emission factors' to '3.3 Region- and country-specific emission factors' - Please make further discussion to compare the emission factors in this study with IPCC default emission factors.

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