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Geoscientific Model Development Discussions

Interactive comment on "A land surface model combined with a crop growth model for paddy rice (MATCRO-Rice Ver. 1) – Part I: Model description" *by* Yuji Masutomi et al.

Anonymous Referee #1

Received and published: 29 March 2016

Dear Authors,

Please find below my comments on your paper "A land surface model combined with a crop growth model for paddy rice (MATCRO-Rice Ver. 1) – Part I: Model description", which describes de adaptation of a LSM, MATSIRO, embedded in a GCM, MIROC-ESM, to simulate the grow and development of irrigated rice, and by consequence the influences of this on the fluxes (energy, water) between land and atmosphere.

The paper is well written. Rice is indeed an important crop worldwide, and the subject is therefore very relevant. In addition to the impact of crop grow, a range of authors have shown that irrigation might have an important impact on the exchange of water and energy between land and atmosphere (it might be useful to add this in your introduction

as a justification).

However I have the following concerns: - The paper does not provide an evaluation, a parametrisation and, most important, a validation of the developed model: I know there is a paper part II on this, but I think that the paper cannot stand on its own without these (I suggest the combine part I and II into one paper). - It is not always very clear what was already part of MATSIRO and what you have developed. It seems to me that only minor adaptations have been implemented up to pg 15 "4.2 Crop development". In this paper you do not describe again all equations of MATSIRO, as this has already been published (you only have to refer to Takata, 2003). By consequence, you can significantly reduce the length of this paper (reduce section 3 to 1-2 pages and section 4.1 to max. 1pg) and add a section on model parametrisation, evaluation and validation. - Some small modifications have been described in section 3 and section 4.1. The explicit reasons for these adaptations are not provided. The impacts of these modifications on the model simulations are missing. What are the added values of those adaptations? Do those modifications affect significantly your model simulations (compared to the original LSM set-up)? Are the modifications you implemented specific for rice or are they more generally applicable? - You assume that your field is flooded (e.g. soil always at saturation level, etc,...): is this assumption correct for the whole year round or only valid during the growing season or parts of it? If this assumption is not valid for the whole year round, can you use this model to make climate simulations, as you suggest in your conclusion? - As you do not do an evaluation of your model, you cannot write some of the statements in your abstract (e.g. l2:"...accurate simulation..": you don't show this in your paper), ...and conclusion. - Describe explicitly in your paper which variables (of your adapted model), are now exchanged between the LSM and the GCM, as you mention in introduction at l14.

I think that the paper needs some major revisions before publication.

Best Regards,