

## ***Interactive comment on “C-Coupler1: a Chinese community coupler for Earth System Modelling” by L. Liu et al.***

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My gut feeling is that the C-coupler approach does contain some interesting and novel approaches. Unfortunately they are hidden in the text and it is difficult for the reader (or at least for me) to catch them. After reading the manuscript it is still not clear to me whether the C-coupler is a piece of software, a library, which manages the tasks for coupling (interpreting the domain decomposition, performing the neighbourhood search, the calculation of interpolation weights, handling of the data exchange and coupling date/time events, . . .) . On the other hand you also talk about a framework that allows to compile software components, to set up a (coupled model) run-time configuration, and to manage the whole workflow for running an experiment. Is the C-coupler at the end a composite of many different things: libraries, programs, and

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scripts? To structure the manuscript into sections exclusively dedicated to the coupling as such and another section about the framework and possibly workflow could help the reader to get a better insight.

It is worth mentioning that the OASIS3 and OASIS3-MCT namcouple configuration file is an ASCII formatted file which requires its own parser routine to read and evaluate its contents. On the contrary OASIS4 does not require an OASIS3-like namcouple file. Here the configuration is described in a xml file. Furthermore, OASIS4 is not a 3D version of OASIS3 but a complete rewrite (except for some SCRIP routines which are used in both software packages. I am a bit confused by your description of OASIS3 versus OASIS3-MCT when it comes to the capability of performing a 3d interpolation. In which way does OASIS3-MCT inherit the 3d coupling function from OASIS4 (P3895, L10)? In your section about MCT you make a very different statement, which is that the user is responsible for providing appropriate weight matrices.

How does the codecouple of CPL6 and CPL7 compare with the OASIS3(-MCT) namcouple and the MCT codecouple?

One the other hand I asked myself to which extent such details are really relevant to understand your approach. Wouldn't it be sufficient to summarise the state of the art in coupling in one short paragraph only and refer to the publications by Valcke et al. (some of them are published in GMD and are thus easy accessible) for further details? The condensed summary should of course touch upon those aspects that help the reader to understand and classify your C-coupler development.

P3898 L14

I think your statement is not correct (or I misunderstood your point). Even with OASIS\* the characteristics of the coupling do not have to be specified in the source code. That is what the namcouple and the OASIS4 xml configuration files are for.

P3898 L22

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Even though OASIS\* does not provide explicit algorithms for flux-computation (apart from the conservative remapping used to interpolate fluxes) I would still claim that OASIS\* is also managing the algorithms for the processing of coupling fields.

P3904 L14

A matter of taste, but I found the analogy more confusing than helpful.

P3908 L19

I really did not get what you mean by “. . . that require equation group solving to support, such as spline”. This needs to be rephrased.

P 3908 L25

What is unique in your approach concerning your time, data, and restart manager? Isn't this something which is provided by all coupling software used for Earth system modelling. Could you indicate where you go beyond existing solutions?

P3911 L18

What makes the internal parallel decomposition that much different from the target decomposition. How is this related to your statement that you can avoid the reduction for sum between multiple processes (apart from the fact that I am not 100% sure what you mean by “reduction for sum between multiple processes”)

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Interactive comment on Geosci. Model Dev. Discuss., 7, 3889, 2014.

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