

Dear author,

Thank you for this updated version of your manuscript, even if I am sorry to say that I consider that it fails to address the referee's major concerns. However, I would be happy to reconsider a new manuscript after major revisions that would address my comments here below.

Major comments

1. p.5 L14: You conclude «Figure 1 demonstrates the poor performance of the P2P implementation» but you do not address the referee 2 comments that :
 - 1- the results can be affected by the decomposition strategy and
 - 2- the decrease in time at the end of the graph in Fig 1 (i.e. for more than 96 cores) should be remarked upon as one may wonder if it will continue to go down.Please modify your text to address these two comments.
2. I do not understand the sentences on Fig. 15 « If the number of cores per toy model is less than 24, the MPI message number per process is set to be the number of cores. Otherwise, the MPI message number per process is set to 24. ». Similarly, I do not understand how you can choose the number of MPI messages per process and make it vary (see last paragraph on p.11 and Fig.16, or 2nd paragraph on p.12 and Fig.17, and many other places in the text). Can you explain ?
3. Section 5.2: I appreciate that you added a test with up to 1024 cores to answer referee1's related comment. But the results illustrated in Fig. 16, 17 and 18 with a toy model still go only up to 192 cores. As referee1, I would have expected that you perform these analysis with higher number of cores; this should be quite straightforward as they are based on toy models and it is easy to increase the size of the grid of a toy model and the number of cores used. As referee1, I do not understand why you did not produce those tests at higher number of cores. If there are sound arguments not to do so, please explain.
4. Last paragraph of section 5.2 and Fig 19: The results on Fig 19 show that the adaptive library is only marginally better for 512, 768, 1024 cores. Therefore, I think the sentence «These results indicate that our proposed implementations can significantly improve the performance of data transfer for higher model resolution.» is misleading and should be rephrased.
5. Section 5.4: you explain that the P2P implementation is sufficient in the interpolation case because the number of MPI messages is small but you should clarify that this is probably linked to the fact that the two grids have close parallel decompositions as stressed by referee2.
6. Section 5.4: again the conclusion of the paragraph is somewhat misleading. In this case, there is no real benefit brought by the adaptive library and it should be expressed clearly. Please rewrite the last sentence of section 5.4 accordingly.
7. Section 5.5 : this section describes the comparison between the P2P and the adaptive library but not with the butterfly implementation so one cannot really conclude on the real improvement brought by the adaptive library. The same comparison should be done with the butterfly implementation as a baseline. Also it is please clarify if Figure 23 shows the gain in data transfer time only or the gain with respect to the whole model time. Finally, I do not understand the sentence « This performance improvement would not be low because the model coupling only takes a very small proportion of execution time in the simple coupled model GAMIL2-CLM3 and the parallel scalability of the two coupled models GAMIL2 and

CLM3 is not good. “ Please clarify and rephrase.

8. Section 6; as underlined by referee1's comment #14, the conclusions are still weak if not misleading. Please rework on the conclusions according to the comments made above.

Other comments

1. Grammar and syntax: please consider the attached version of your current manuscript with some propositions to improve the english grammar and syntax.
2. Title of the paper : Please give a more precise title and mention « adaptive library » in it, something like : « A new data transfer adaptive library improving model coupling. »
3. In your reply, you mention that the «version number has been added into the software» but I do not see any specific number or name for your library in the text and it is indeed missing, also in the title.
4. p.2 : when you refer to OASIS, please use also Valcke et al 2015, which describes the latest OASIS3-MCT version (see the modified document).
5. p. 3, L16-17: Your statement “can only scale to about 100 processor cores when using OASIS3 (Valcke, 2013) and to about 1000 processor cores when using OASIS3-MCT (Valcke et al., 2013);” is not correct. The reference does not show that the data transfer does not scale for more than 1000 cores; instead it shows that the data transfer does scale for up to 1000 cores. Please remove the sentence or rephrase it.
6. p.4, L18-20 : It seems awkward to conclude here that «P2P implementation can achieve good performance when rearranging data fields for a parallel interpolation in a component model» as this is indeed shown in section 5.4 and Fig. 22; this should be removed at this point in the text.
7. p.4, L21: The references Valcke, 2013; Valcke et al., 2013 do not show that P2P is “not efficient enough when transferring data between component models” as stated. Please remove those references there.
8. Fig 4 : I think the legend of the x axis should be changed from « number of cores per process » for « number of cores per model » ; can you confirm and make the change ?
9. p.6, 2nd paragraph : I do not understand why you refer to Fig 6 and Fig 3. Please explain or remove the reference.
10. Fig 12 : I do not understand the meaning of the last sentence « Each process of the sender is mapped onto a process of the butterfly kernel, while every two processes of the receiver are mapped onto one process of the butterfly kernel». I think it does not bring any additional information. In particular, if the receiver has 10 processes and if only 3 processes of the receiver are used for the butterfly kernel, how can this be 'every two processes of the receiver' . Could you please explain or remove the sentence?
11. 2nd paragraph of 5.3 and Fig. 20: The last sentence “When each component uses 192 cores, the adaptive data transfer library is 4.01 times faster than the P2P implementation“ is right but Fig. 20 also shows that butterfly and adaptive seem to converge when increasing the number of cores per model. This should also be described in the text.

12. Figures 15 to 22, it would be better to change « Library » for « Adaptive library » or « Adaptive »
13. Figure 20 and your response to Referee2's comment #7: I do not understand the sentence « The P2P results are from the adaptive data transfer library which switches to the P2P implementation. » and this is not mentioned in the text. Please clearly explain what it means.