Geosci. Model Dev. Discuss.,
doi:10.5194/gmd-2015-267-RC1, 2016

Geoscientific Model Development Discussions
Open Access
EGU

Interactive comment on "YAC 1.2.0: An extendable coupling software for Earth system modelling" *by* M. Hanke et al.

Anonymous Referee #1

Received and published: 16 February 2016

Paper: YAC 1.2.0: An extendable coupling software for Earth system modelling

Authors: Moritz Hanke, Rene Redler, Teresa Holfeld, and Maxim Yastremsky

1 Summary

This paper introduces a new coupler library, named Yet Another Coupler (YAC). It provides a flexible API which can be used to couple multiple components of a climate model together, for example an atmosphere and an ocean component. This library provides interpolation and communication routines which can be used to map fields from one component to another in a way that meets some criteria, for example conservative remapping.

Full screen / Esc

Printer-friendly version

Discussion paper

This paper documents the interpolations methods provided, describes the justification for certain software choices (for example using C instead of Fortran), and provides some basic performance data.

Overall, the manuscript is written well, with a handful of minor typos. It describes the capabilities and justifications for YAC well.

I would recommend this manuscript for publication in Geoscientific Model Development after some modifications.

2 General Comments

Overall, this manuscript is well written and very readable. It spends a lot of time discussing the capabilities of OASIS3 and OASIS4 outside of the introduction, and using them to justify decisions made for YAC. A lot of this seems unnecessary, and could easily be removed without negatively impacting the manuscript. Including this makes the manuscript seem almost like it is intended to describe those couplers as much as YAC.

The performance results are overly simplistic. With only a single result provided for readers to gauge the performance of the coupler. Additionally, performance results are only provided for the global search portion. While this may be the most expensive part of this coupler, it is also only performed once in a given simulation. It would be useful if the authors provided performance results for coupling steps including the interpolation from one grid to another and communicating the results. Additionally, it would be useful to show a semi-realistic example where the two models that are coupled together are not colocated on the same nodes / processors. It would also be useful to provide performance for the global search for additional interpolation methods, similar to the one-off discussion found in Section 6.

The software package makes it seem like the capabilities provided are new enough in that it is flexible enough to easily modify independent portions of the coupling package, to add new interpolation methods or communication routines.

One major issue with the manuscript is that it is not clearly documented where to gain access to the source code or find instructions for building / running the tests that are discussed in the manuscript. Navigating the doxygen site (as recommended in the manuscript), I have been unable to find instructions for downloading / building YAC, so that part was not tested / reviewed, and I cannot comment on the readability of the source code.

Corrections

Page 2, Line 2: “Earth System Modelling Framework” should be “Earth System Modeling Framework”, as it is the name of software package. This change should be made throughout.

Page 2, Line 14: “to perform the neighbourhood search” should be “the neighbourhood search to be performed”

Page 2, Line 17: “So why we are not” should be “So why are we not”

Page 2 Line 17: “and adapt this to our needs?” should be “ and adapt it to our needs?”

Page 2, line 26: “allow the model components in future” should be “allow the model components in the future”

Page 2, line 28: “off-line in a pre-process.” should be “off-line in a pre-process step.”

Page 3, line 27: “coupler processes has to be started.” should be “coupler processes have to be started.”

Page 3, line 28: “do the actual interpolation and” should be “do the actual interpolation, and”

Page 3, line 30: “mainly Fortran90 with some few parts” should be “mainly Fortran90 with a few parts”

Page 4, line 6: “extended to accommodate for the specific” should be “extended to accommodate the specific”

Page 4, Line 7: “software stack growing almost exponentially” should be “software stack grow almost exponentially”

Page 4, line 8: “send, process and receive” should be “send, process, and receive”

Page 4, Line 17: “paradigms and” should be “paradigms, and”

Page 4, line 17: “but have not found its way” should be “but have not found their way”

Page 4, line 22: “As already outlined before we” should be “As already outlined before, we”

Page 4, line 24: “Despite its advantages the OASIS” should be “Despite its advantages, the OASIS”

Page 4, line 25: “With YAC our aim” should be “With YAC, out aim”

Page 4, line 30: “or replace the selected one” should be “or replace the current one” or “or replace a selected one”

Page 4, line 31: “the same way different” should be “the same way, different”

Page 5, line 14: “among C compiler” should be “among C compilers”

Page 5, line 30” itself already serve as” should be “itself already serves as”

Page 6, line 1: “Furthermore the tests” should be “Furthermore, the tests”

Page 6, line 4: “short test programs we” should be “short test programs, we”

Page 6, line 13: “web site is rebuild,” should be “web site is rebuilt,”

Page 7, line 11: “this type of source grids.” should be “this type of source grid.”

Page 7, line 24: “For example a new” should be “For example, a new”

Page 9, line 30: “may not be suited to” should be “may not be well suited to”

Page 10, figure 1: Please expand the caption of this figure. Alone the caption is not enough to determine what each of the subfigures represents, or what the triangles / rectangles are.

Page 11, line 1: “not got any” should be “no”

Page 11, line 2: “of less that 34” should be “of less than 34”

Page 11, line 11: “for each target polygons” should be “for each target polygon”

Page 12, line 5: “is lower that n” should be “is lower than n”

Page 12, line 6: “are calculated one the sphere” should be “are calculated on the sphere”

Page 12, line 7: “As an alternative simple” should be “As an alternative, simple”

Page 15, line 24: “in a way that it gets well” should be “in a way that it becomes easily”

Page 17, Figure 4 is captioned with “Performance of YAC for 1st-order conservative remapping”, while the text says that Figure 4 represents only the global search portion of the interpolation.

Page 17, line 13: “for each coomponent” should be “for each component”

Page 18, line 22: The sentence that begins with “As the CDO software is used world-wide” doesn’t make sense. Please rewrite it.

Page 19, line 14: “A build-in support” should be “The built-in support”

Interactive comment on Geosci. Model Dev. Discuss., doi:10.5194/gmd-2015-267, 2016.