

Interactive comment on “Improving data transfer for model coupling” by C. Zhang et al.

Anonymous Referee #2

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This paper tackles an important technical area in coupled climate modeling: efficiently transferring data between components of the model while running on a parallel super-computer. They show a good understanding of the current state-of-the-art in climate models but are missing some of the history of butterfly networks in parallel computer design. Consider for example: “Packaging and multiplexing of hierarchical scalable expanders” F. Chong, E. Brewer, F. Leighton, T. Knight Jr., *Parallel Computer Routing and Communication*, Volume 853 of the series *Lecture Notes in Computer Science* pp 200-214, 1994.

Ian Foster’s book on “*Designing and Building Parallel Programs*” also covers butterfly algorithms in Chapter 2.4. These and similar work must be referenced.

In their performance testing, the results can also be affected by the decomposition strategy (decomposing the domain by lat-lon blocks or by latitude stripes). Its not clear

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if the two land and atmosphere domains have different decomposition strategies which would impact performance. Please clarify.

Overall this algorithm appears to be most useful on medium-sized grids and modest processor counts. That’s ok but these limitations should be mentioned or data for larger cases presented.

Specific Comments

The decrease in time at the end of the graph in Figure 1 should be remarked upon. Will it continue to go down?

It’s not clear what generated the data in Figure 2. Is that a P2P test program from an MPI distribution? And was it on the same machine?

The initialization overhead for the adaptive library could become to expensive at 1K and larger processor counts even if its only run once. It might be better to run it offline and read in the results when the climate model starts. Again a large case would help.

For Figure 15, are the “P2P” results from the unaltered CPL7 coupler or from the P2P option in their library? Please clarify.

Technical Corrections: “network contention” is the preferred phrase instead of “jam of network communication” or “jams in communication”.

There is more odd English phrasing throughout.

Interactive comment on Geosci. Model Dev. Discuss., 8, 8981, 2015.

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