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Geoscientific Model Development Discussions

Interactive comment on "Influence of parallel computational uncertainty on simulations of the Coupled General Climate Model" *by* Z. Song et al.

P. Jöckel

patrick.joeckel@dlr.de

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Some very important points, which need to be discussed, are missing:

1. An explanation or at least a summary, why the number of CPUs changes the results (on the same architecture!) is clearly required. Is it simply because MPI "all-reduce" functions are used? In this case it could be avoided.
2. Other model systems produce (on the same architecture!) binary identical results (for the same given initial and boundary conditions), independent on the degree of MPI parallelisation. What is different here and could it be avoided? Is it not avoided, simply for the sake of a better run-time performance? If the latter is the case, one might ask the question: What is cheaper: the need to perform always

(for each setup!) ensembles to assess the "implementation uncertainty" **in addition** to the desired "physically perturbed" ensembles, or to invest in a presumably slower setup which avoids the dependence of the results on the parallelisation?

3. Why is there a need to modify the degree of MPI parallelisation within the scope of a study (you mention this in the text as motivation)? Once the optimum decomposition is found for a given architecture, why can't it be kept?
4. Do you expect different sensitivities (to the degree of the MPI parallelisation) on different architectures?

Interactive comment on Geosci. Model Dev. Discuss., 4, 3295, 2011.