Geosci. Model Dev. Discuss., 8, C3724–C3725, 2016
www.geosci-model-dev-discuss.net/8/C3724/2016/

Geoscientific Model Development Discussions
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Interactive comment on "Bitwise identical compiling setup: prospective for reproducibility and reliability of earth system modeling" *by* R. Li et al.

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Received and published: 18 January 2016

We thank Referee #1 for the comments. We will improve the manuscript according to these comments when revising the manuscript. Here we'd like to reply these comments one by one.

1. p9825: L14: One can almost answer the question "why does POP2 obtain different simulation results when changing the optimization level from O3 to anything else" by looking at the Intel compiler manual. The -O3 option uses a very fast math library which sacrifices accuracy for speed.

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Response: Yes, it is true that compiler optimizations for speed may sacrifice accuracy. So it is reasonable that POP2 obtain different simulation results when changing the optimization level from -O3. However, compiler optimizations should not bring new bugs to the applications. The example 2 in this manuscript shows that different results can not only result from accuracy sacrifices by the -O3 option but also result from compiler bugs that should be detected and avoided.

2. p9830, L10: Is this the same bug mentioned in Table 9? Please clarify.

Response: Yes, it is the same bug mentioned in Table 9. We will clarify it in the revised manuscript.

3. p9838: In Table 3, please give a brief definition (or cite to the appropriate reference) of what the "fast|precise|strict|source" options do. Also please define SIMD.

Response: Thanks a lot for this comment. We will add the missing definition in the revised manuscript.

4. pp9843-9845: If possible, please give brief description of why the bitwise-identical compiling setups obtained with Intel Fortran Compiler v11 are not reproducible with later Intel compilers.

Response: This is because the version 11 and the subsequent versions use different default instructions to generate the binary code (https://software.intel.com/en-us/forums/intel-visual-fortran-compiler-for-windows/topic/281713), which produces different bitwise results (https://software.intel.com/en-us/forums/intel-visual-fortran-compiler-for-windows/topic/279705). We will also explain it in the revised manuscript.

Finally, errors in English usage mentioned will be corrected in the revised manuscript. Thanks for pointing out.

Interactive comment on Geosci. Model Dev. Discuss., 8, 9817, 2015.