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Interactive comment on "MP CBM-Z V1.0: design for a new CBM-Z gas-phase chemical mechanism architecture for next generation processors" *by* Hui Wang et al.

Anonymous Referee #3

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This paper designed a new framework for an air quality model to adapt the new Intel architecture to improve the computing performance, which is very useful for HPC, model developer. I therefore fell that the manuscript is suitable for Geoscientific Model Development and Major Revision is needed. Some comments and suggestions follow below. I hope this paper can be more useful through further revisions.

1. Writing The writing is not good. I think the authors should look for a native language person to polish it. Some sentences are hard to understand, especially in 3.3 Performance Test and figure captions.

2. Experiments and analysis

Printer-friendly version

Discussion paper

a. The authors did not give the information about the floating precision of the model. Double precision, or single precision? The performance should be difference, I think. If possible, the authors had better show the results of model with both single and double precision.

b. In this paper, the authors only give the results with one node. How about the model's captions? Is the performance (speedup) on KNL still better than CPU?

c. In performance test, authors only test the MPI and OpenMP separately. It's very interesting that the performances are almost same. Can authors explain that? I just wonder how about the computing performance by using MPI/OpenMP hybrid parallel method?

d. It takes 539.86s with one CPU core while 4481.10s with one KNL core. The authors blame the worse performance to lower frequency of KNL. It's difficult to understand because frequency difference between CPU and KNL is significantly and much less than the computing difference. Other factors, such as memory bandwidth, should also contribute the computing difference.

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