Geoscientific
Model Development
Discussions

Interactive comment on "Performance evaluation of throughput-aware framework for ensemble data assimilation: The case of NICAM-LETKF" *by* H. Yashiro et al.

H. Yashiro et al.

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We appreciate your careful reviewing and positive comments and encouragements. Point-by-Point replies to your comments are as follows.

1) The paper does not seem to reference enough previous work in the scalability problems of EnKF systems at high resolution/ensemble size

[reply]

Thank you for the suggestion. We add some references.

2) An important aspect for this type of applications are the load balancing issues, es-

pecially in connection with inhomogeneous observing systems.

[reply]

There is a trade-off between computational load balancing and data movement. Miyoshi et al. (2010) changed grid point allocation to each node while paying attention to the load balancing. In our study, we revert this change to avoid the data movement by global communication. The ratio of floating point operations to memory accesses in LETKF analysis is large. This type of calculation is expected to become faster by performance enhancement of the future processor. It is easier than the improvement of throughput in global communication with massive nodes. We should select the best method for load barancing according to the number of nodes, the number of observation, the analytical method used in the LETKF, and the performance of computer system.