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Geoscientific Model Development Discussions

Interactive comment on "An automatic and effective parameter optimization method for model tuning" *by* T. Zhang et al.

Anonymous Referee #1

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General comments:

This paper described an automated optimization method of tuning empirical parameters in a global atmospheric model. It also provided the performance of the optimization method and the tuned results of the model. The novelty of the method includes the two additional steps on parameter selection and the choice of the initial values of the parameters. The method can be potentially used in other models. The paper is well written. I recommend publication of the with some minor revisions as follows.

Specific comments:

1. Page 3798, line 17, "quit" should be "quite". 2. Page 3801, the sentence in line 16 is a repeat of the 1st sentence on the same page. It should be removed. 3. Page

3802, line 25: This long sentence is not clear. It should be rewritten. 4. Line 3804, 2nd paragraph: The physical explanations should be improved. If the model used the stratiform fractional cloud condensation scheme of CAM3 or CAM4 (Zhang, et al. 2003), reducing the "rhminh" threshold will not only increase the cloud amount, but also increase the stratiform condensation rate and decrease the atmospheric humidity. Likewise, increasing the "rhminl" will do the opposite. This is why you see clear opposite changes of RH and CLOUD in the lower troposphere and upper troposphere in Figure 6.

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