

Interactive comment on “Incorporation of the C-GOLDSTEIN efficient climate model into the GENIE framework: the “genie_eb_go_gs” configuration of GENIE” by R. Marsh et al.

Anonymous Referee #2

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[General comments]

In this paper the basic structure as a scientific paper is not clear (that is, to address of relevant scientific questions, to develop methods and assumption, and to solve the question, and then to reach substantial conclusions; perhaps the authors may think that for this journal such structure could be forgotten, but the reviewer’s checklist emailed from the editor includes these points). Much information are presented (using many figures and tables) with no clear purpose and conclusion, and consequently, the impression of the paper is not being a scientific paper, but a technical note or a manual. This paper may be very helpful for GENIE developers/users, but not so for people who

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are not involved in C-GOLDSTEIN/GENIE projects. Probably, the major contribution of the paper is to show the difference in outputs for four meshes. But somehow Greenland is attached to North America for only one (or three? See specific comment for P13L13-14) mesh, which makes it difficult to carry out a fair comparison (in my experience, this may drastically change the Atlantic MOC and then other important variables including ocean temperature and salinity). And if every time they get some results the authors should iterate that parameters tuned for 36x36s mesh may make us overestimate the performance of that mesh, what was the purpose of the comparison? I wonder that just saying "the choice of the mesh has a significant effect on some of the results" is not enough as a conclusion of a scientific paper. For making the paper accepted, the authors should reorganize it so that the readers can clearly understand the purpose, the validity, and the conclusion of the four-mesh comparison.

[Specific comments]

P8L14 Provide URL/ftp info for "genie-embm/src/fortran/makefile".

P8L18-22 If possible, present the change in precipitation representation as a figure

P8L19-20 Provide quantitative information on the condition to be precipitated (in specific humidity and/or relative humidity).

P11L15-16 Provide a clear purpose (and a conclusion) to use the same topography in 72x72 and 36x36.

P13L13-14 (1) The sentence says Greenland is detached only in 36x60, but in figures (Fig 1,2,etc) GL is attached only in 64x32. Which is true? (2) Provide detailed explanation on the reason why the authors didn't use the same condition (in that GL attaches/detaches to North America)?

P13L15-16 Explain physical meaning of isles=1 and =2.

P14L15- Provide quick explanation of the initial conditions.

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P16L14-17 Does it mean that the legend of the figure is not correct for 72x72(x16)?

P17L5-6 Why can you say so?

P20L24-25 For potential temperature and salinity, which layer is used? Only surface layer? If so, only for 72x72(with16layers) a thinner surface layer is used?

P21L2-3 Provide formulation to consider both of grid-cell areas and observed variance.

P22L11-12 How do you (they) determine the default parameters for 36x36?

P22L21-22 What kind of observational data is used for the comparison here?

P23L14 556ppmv is not the doubled value of 282.9 (Table 4). Why?

P25L14/16 Being bistable for 64x32 seems related to attachment of Greenland and Canada, and for 72x72s having 16 layers seems to cause the difference. What do you think?

P26L11 Do you have any idea to explain why 36x36 runs so fast (in comparison to 64x32)?

P27L14 Provide information of not a real time ("nearly one month") but a model year.

Table8 (1) Provide total score as well. (2) Why do you think 36x36s (parameters are tuned for this) atmosphere has the poorest score?

Figure 5 Provide more information of "upper" and "deep".

Fig 41 May be better to explain what the soil/dashed lines indicate.

[Technical corrections]

P23L23 Fig 16 -> Fig. 18?

P27 L11 delete one of two "yet".

Interactive comment on Geosci. Model Dev. Discuss., 2, 1, 2009.

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