

Interactive comment on “qtcM 0.1.2: A Python Implementation of the Neelin-Zeng Quasi-Equilibrium Tropical Circulation model” by J. W.-B. Lin

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This paper presents a very innovative and attractive new way of controlling and experimenting with model parameterization. It is well written, clear and concise. It promotes advancement and new ideas in model development, without throwing away years of experience in the field. The paper is easy to follow and its technical aspects have been made really accessible to non-specialists.

Questions:

1) Does the paper address relevant scientific questions within the scope of GMD? Absolutely it couldn't fit any better. 2) Does the paper present novel concepts,

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ideas, tools, or data? Mixing new language with the old-optimized Fortran code is definitely a new and exciting way of looking at models. 3) Are substantial conclusions reached? Yes 4) Are the scientific methods and assumptions valid and clearly outlined? Yes 5) Are the results sufficient to support the interpretations and conclusions? Yes 6) Is the description of experiments and calculations sufficiently complete and precise to allow their reproduction by fellow scientists (traceability of results)? Yes 7) Do the authors give proper credit to related work and clearly indicate their own new/original contribution? Yes 8) Does the title clearly reflect the contents of the paper? Yes 9) Does the abstract provide a concise and complete summary? Yes 10) Is the overall presentation well structured and clear? Yes 11) Is the language fluent and precise? Yes 12) Are mathematical formulae, symbols, abbreviations, and units correctly defined and used? Yes 13) Should any parts of the paper (text, formulae, figures, tables) be clarified, reduced, combined, or eliminated? See specific comments 14) Are the number and quality of references appropriate? Yes 15) Is the amount and quality of supplementary material appropriate? Yes

Specific comments:

1 introduction

#1 Many climate models are still written in compiled languages (primarily Fortran); I would add a short explanation of compiled; and why it takes longer to develop (the whole code has to be re-optimized and linked etc);

#2 Recent versions of Fortran;. I would specify which one (90/95/98) and make a point that even these are already old;

#3 Some modern languages are also interpreted; in those languages, source code is directly executed without a separate compile step; I would say executed at run time;, the addition of the comment #1 will help understand your point here

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3.1 Package and Model Structure

#4 submodule defines class Field (described later); That part was confusing, I think it needs a minimal explanation

#5 same for Qtcm

#6 The second paragraph should be preceded with a simplistic explanation of Object Oriented Concept: mainly instances and inheritance. Otherwise a user w/o knowledge of OO (and there might be a lot out there) will be really lost.

#7 Qtcm instances have public methods (get qtcm1 item); Same thing OO section needs to be added to truly understand this.

#8 A Field instance stores the value of the variable in an attribute named value, and metadata related to the; Explain what metadata; is

#9 All model parameters are attributes of Qtcm instances. Field variables, at the Python-level, are also Qtcm instance attributes;. This took me a while to understand. I think the wording is a bit confusing. Try something more straightforward, maybe like: Qtcm instance have 2 sort of attributes: the model parameters and the Field variables (At the Python level). Again the section suggested in comment #6 would greatly improve understanding of this sentence: instance/method/attributes/class all of this is easily confusing to a novice of OO programming.

3.4 passing restart snapshots between run sessions

#10 current instance state as the run session's initial values; Does that mean it uses November 11+30days as November 1st?

3.5 Creating Multiple Models

#11 I would add another figure here that shows examples of what could be different (# of days, land on, etc;)

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3.7 Run lists

#12 … change the elements of the list using any of the list methods provided by Python (e.g., append)… Show in the figure 5. It is not obvious how to reset the list.

#13 …The ﬁnal routine is not a routine at all, but another run list… How somebody not “in the know” can figure out the difference between a function

Technical corrections

1- Introduction

#1 …Python’s lack of a separate compile step… Replace with Python’s lack of a separate lengthy compile step

3.2 Creating a model instance and running the model

#2 … keyword parameter argument lists can be passed in as a dictionary… Replace with … keyword parameter argument lists can be passed in as a dictionary (a set of key/value pairs)…

Interactive comment on Geosci. Model Dev. Discuss., 1, 315, 2008.

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