

Dear Topical Editor Sylvester Arabas

First of all, let me point out that the GMD code availability policy extends to all code needed to reproduce results presented in the paper including scripts that automate model runs and visualization. In the case of the present paper, this should cover scripts automating the SSolar\_GOA and libRadtran runs for the comparative analysis. Please provide the code required to reproduce the plots presented in the paper (e.g. as an electronic supplement to the paper or at a persistent repository as Zenodo).

**Answer: We have inserted in Zenodo the input file to run the libRadtran. Related with the plots, each figure was created individually with Excell 2013 and we do not understand what means to provide the code.**

**Answers to the comments related to the minor corrections to the revised manuscript "SSolar-GOA v1.0: a simple, fast, and accurate Spectral SOLAR radiative transfer model for clear skies" submitted to Geoscientific Model Development (GMD) by Victoria Eugenia Cachorro, Juan Carlos Antuña-Sánchez and Ángel Máximo de Frutos**

**The authors thank to Editor for the effort to review and the supervise the manuscript**

\* Page 1 (abstract)

- line 7: physical-based -> physically-based----- **Answer: done**
- line 17: sentence "Besides, ..." unclear -----**Answer: it was removed**
- line 18: remove "extensive" ----- **Answer: done**
- line 21: "shows a high performance ... and it underestimate" - please shorten, perhaps clarifying that the presented validation quantified the relative differences...  
**Answer: The earlier sentence " From the results of the comparison with libRadtran, the SSolar-GOA model shows a high performance for the whole spectral range and" was changed to "The SSolar-GOA is validated by a quantitative comparison with libRadtran, showing that "**
- line 27: remove "Obviously"----- **done**
- given the journal and paper scope, I suggest to include in the abstract and introduction a mention of implementation in Python and open-source licensing  
**Answer: two short sentences was added, one to the abstract (line 30-31) and one to the introduction (line 78) according your recommendation.**

\* Page 2:

- line 48: should "Research Centres" be capitalised?----- **Answer: no, changed**
  - line 51: crossed out "in a" ----- **Answer: done**
  - line 52: Hodges 1993 cited as Hodges 1990----- **Answer: changed to 1993**
- In the introduction, related with the references to Data bases is not easy how to be

\* Page 3:

- line 93: "allows" -> "allow" ----- **Answer: done**

\* Page 4:

- line 116: "has the drawback" -> "comes with a tradeoff" ? -----  
**Answer: This sentence " The ASD solar irradiance..... " has changes substantially (lines 115-118)**

\* Page 5:

- line 131: the "or" in units parenthesis is unclear ----- **Answer: removed**
- line 134: "widest used" -> "most widely used" ----- **Answer: done**
- line 145: rephrase "disappeared" -----

**Answer: the sentence was changed to** "As can be seen, the explicit dependence on the  $\cos(\text{SZA})$  of expression (1) is removed in expression (2)".

- line 153: "law" missing after Bouguer ----- **Answer: done**
- line 153: remove "easy" ----- **Answer: done**

\* Page 6:

- line 163: "solver" -> "solvers" ..... **Answer: done**
- line 166/167: "but contains" -> "and comes in" ? ----- **Answer: changed to "and presents"**

- line 178: "which has undergone..." - what is the purpose of this statement?

**Answer: the idea was to explain the origin and evolution from a program "uvspec" to a big Code and now a package that contains many Codes as a whole. We added at the end of the sentence "..... to reach the current libRadtran structure"**

- line 181: package -> source code ----- **Answer: done**
- line 184: remove "really" ----- **Answer: done**
- line 186: two sentences in a row begin with "Therefore, "----- **Answer: done**
- line 187: what does "the Mie program" refer to?-----

**Answer: clarified, we have added** "(see libRadtran user's guide Chapter 4) "the calculation" into the total sentence (lines 190-192)

\* Page 7:

- line 201: "high" -> "height" ? ----- **Done**
- line 205: "though" -> "through" ----- **Done**
- line 206: give example references to these models----- **Done**
- lines 207-209: "This is a physical, fast, ..." suggest removing this sentence--**Done**
- line 209: "As already mentioned, the core of the model is the simplicity of the" -> "The crux of the model is the simple" ----- **Done**
- line 251: rephrase "working very well" (aimed at operation within the ... range ?)

**Answer: done**

- line 220-221: "The model, in some way, ..." - unclear sentence

**Answer: the sentence was changed to** "The model may be easily adapted to the case of limited available information about model's input parameters".

- line 221: "The model as described may be easily replicated by the readers, or it may be download Windows version"

-> "The SSolar\_GOA v1.0 is released as free and open-source software.

It is implemented in Python offering portability across architectures and operating systems.

For download instructions, see the Code Availability section."

- **Answer: Your recommended sentence have been added in the text and removed that of the earlier version (lines 227-230)**

\* Page 8:

- line 235: "and various" -> unneeded "and" ----- **Done**
- line 140: "where implicitly it is assumed the non-interaction between these processes" -> "where the non-interaction between these processes is implicitly assumed" ----- **changed**

- equation 7: looking at the code, the exponent at the last lambda in the denominator should be "-4" not "4" -----  
**Answer: It was an error, is -2 and expression (7) was corrected in the manuscript. This error do not make any influence in the values of output irradiances of the model**  
- line 270: "and sea level" -> "and the sea-level pressure" ----- **replaced**

\* Page 9:  
- line 296: "model includes a file": this mixes implementation with formulation, would better sounds as "model uses tabulated coefficients" ? ----- **Yes, done, changing de sentence**

\* Page 10:  
- line 304: remove "very"----- **Done**

\* Page 11:  
- line 338: "However, inverse to" -> "In contrast to"----- **Done**  
- line 342: suggest removing "so care must be taken with the units of both quantities in the previous expressions" -----**Done**

\* Page 12:  
- line 373: please rephrase "as necessary approaches for developing a simple model under the consideration of non-interaction"  
**Answer: Sorry, It is not easy to modify this sentence. However, it was modified. We try to say that scattering and absorption processes are taken without interaction between them which simplify considerably the formulation of the model. The new sentence is "Scattering and gas absorption are applied to a single atmospheric homogeneous layer in the SSolar-GOA under the consideration of non-interaction of both processes, which simplify considerably the formulation of the model."**

\* Page 13:  
- line 380-381: remove "but a spectral file for p is very easy to implement in the model" ----- **Yes, removed**  
- line 393: "are usually taken from the bibliography." - please rephrase and be precise (what "usually" and "from the bibliography" mean?)  
**Answer: done, changing a few the sentence and adding two references "given in different publications (Dubovik et al., 2004; Hamill et al., 2016)".**  
- line 393/394: remove "Finally, we call attention to the total number of expressions/formulas..."  
(or rephrase and elaborate being precise which other models you refer to and what "number of formulas" implies: implementation challenges, computational cost, ..)  
**Answer: done, changing a few the sentence and adding tree references "(e.g.: Bird, 1984; Gueymard, 1995, 2005; Xie and Sengupta, 2018)"**  
- line 395: suggest adding a screenshot of the graphical user interface here  
**Answer: done as Figure 1 and all figures were renumbered. As consequence the last sentence of section 3 was changed to "In our model, we it can select three different extraterrestrial work files, given by Wehrli, (1985), Kurucz, (1992) and Gueymard, (2004), as it appears in Figure 1."**

- \* Page 14:
  - line 415: remove "bear in mind that" ----- **Done**
  - line 433: remove "Before the two comparisons,"----- **Done**

- \* Page 18:
  - line 489: rephrase "interval in nm of the model"-----
  - Answer: the sentence was slightly modified and "in nm" was removed. I hope this results in a more clear sentence**
  - line 501: "it can observe" -> "one can observe" ? ----- **Done**

**Modification in Page 19-20: The paragraph just after current Figure 9 was moved before the Figure.**

- \* Page 24:
  - line 579: "consistence" -> "consistency" ----- **Done**
  - line 581: "component are" -> "components are" ----- **Done**
  - line 583: "range stand out" -> "range stands out" ----- **Done**

- \* Page 27:
  - first paragraph of 4.2 is all bold----- **Yes, it was corrected**

- \* Page 39:
  - line 785: remove "it is true that" ----- **Removed**
  - line 795: rephrase "easy-to-understand"-----
  - Answer: now at line 794. The sentence "built with a set of easy-to-understand input parameters" was slightly changed to "based on a set of input parameters easy to use and understand."**

- \* Page 40:
  - line 807: "and the idea is to implement this new" - rephrase, perhaps like "will be considered in further model development" (to clarify it is not available as of now
  - Answer: now at line 805-808, senetence modified as recommended**
  - line 813: rephrase around "two more influent" (and remove parenthesis)

**Answer: Changed to " being these two atmospheric components the most influential".**

- line 815: "is easy to understand and evaluate" -> "results in concise and computationally undemanding formulation" ? ----- **replaced**
- line 815: "but more important is that" -> ". Importantly, it was shown that the assumption of" ----- **Done**
- line 818: rephrase "one layer or multiple layer do not added"----- **Done**
- line 822-823: correct "for many applications in solar energy for different application agriculture" ----- **Done, with some modifications**
- line 824: "Depending of the required accuracy" -> "Depending on the required level of accuracy"----- **Done**

- \* Page 41:
  - line 831: correct "which is covers" -----**corrected to "which is covered"**

- line 836: rephrase "but it must be in mind", "easy to use, which cannot to compete" ----- **the sentence was changed to**  
"which cannot to compete with multilayer RT Codes that solve the RT equation"
- line 837: rephrase "It is not easy to find in" to "To the authors' knowledge"-- **Done**
- line 839: correct reference year (1919)----- **Corrected**

\* Code availability:

- Please elaborate what you mean by "portable". Given the code is developed in Python, it is portable across platforms and operating systems by design.

**Answer: We replace the sentence: "A portable version can be downloaded for Windows users..." by "For Windows users a binary package has been generated which can be downloaded from.."**

\* Zenodo archive:

- the readme file mentions installation, but it's more a "installation of dependencies" rather than package installation.

**Answer: The installation instructions include the installation of the dependencies because this is the only thing necessary to run the application.**

- the archive contains numerous cache files ( \_\_pycache\_\_ dirs with \*.pyc files)

**Answer: done**

- the archive is a tarbomb, please include a top directory in it

**Answer: done**

- the 1.7MB size of the .ico file is intriguing

**Answer: done**

- after launching the program for the first time, the parameter values do not match defaults (clicking "Load default inputs" on a freshly opened window changes many parameters)

**Answer: done**

- the software license is not specified within any of the files in the code archive, please at least include a COPYING file

**Answer: We add LICENSE file**

\* Figures:

- all figures need to be supplied in a vector graphics format (not raster graphics/screenshots)  
(similarly, in the SSolar\_GOA user interface, the "Save image" feature would best allow to save in publication-ready vector format (svg, pdf, ...))

**Answer: Vector graphics format was already done in the previous version. The "Save image" of SSolar-GOA user interface is in svg format.**

\* References (see <https://www.geoscientific-model-development.net/submission.html#references>):

- some entries have journal names abbreviated, some not (see the above URL for suggested abbreviation database),

**Answer: the journal abbreviation was revised and write correctly**

- some abbreviations include dots, some not,

**Answer: we had remove the dots, but hey appears in the original article-reference**

- some entries use all-words-capitalised, some first-word-capitalised format,

**Answer: This was revised and all entries use capitalized format**

- Fouquart & Bonnel: missing capital letter (Earth's)----- **done**
- libRadtran user's guide: multiple years unclear, missing authors (Bernhard Mayer, Arve Kylling, Claudia Emde, Robert Buras, Ulrich Hamann, Josef Gasteiger, and Bettina Richter), missing version number, please consider asking the authors to post the pdf at a permanent location (arxiv, zenodo, ...)

**Answer: We put two references separated, 2015 and 2020. To ask the authors requires more time.**

- ASD Full Range: wouldn't "Malvern Panalytical, 2021" better serve as label?

**Answer: We prefer to put ASD, because this instrument is known as ASD into the scientific community.**

- Hodges 1993: unclear what the 1993 year refers to, the website pointed by the DOI does not list Hodges name, "Unitet State" – typo

**Answer: This reference is complicated because is not a journal article. We have modified the references according to <https://www.osti.gov/biblio/108148>.**

**Answer:**

- Kurucz 1992: is it this paper: <https://doi.org/10.1017/S0074180900124805> (if so, the year is invalid)

**Answer: the doi was corrected and the year is 1992, Observe that the reference has been changed substantially.**

- Sukhodolov 2014: bogus doi url, missing capital letter in "evaluation"

**Answer: done**

- Utrillas and Vergaz entries are coalesced

**Answer: done**