This manuscript describes and validates a methodology to derive incoming surface solar radiation provided certain atmospheric conditions and which is designed to work over complex terrains and cloudy conditions. Overall the manuscript is well written and structured. The text fails however to engage the reader sufficiently. My main concern is that the Abstract, Introduction and Conclusions sections need some rewriting to reflect the importance of developing such a methodology. More emphasis should be put on the applications and users that can benefit from the model, how this effort relates to similar initiatives and how it adds something new and unique to the field of research. Currently the manuscript is very descriptive but needs to give a better background on similar activities and highlight an overall aim so the reader can understand the research gap it is attempting to fill.

I do suggest the manuscript to be published if this is corrected. In addition, some other minor comments bellow (having line numbers in the draft would have been helpful!):

Abstract

- Delete 'abstr' from the beginning. This applies to all sections.

- Change 'making using' for 'making use'.

- Be consistent in the way you spell 'modelling'.

- Same with 'parametrisation', 'parameterisation'.

Introduction

- Change 'modern computing power efficient' for 'modern computing, power efficient'.

- Change 'various degree' for 'various degrees'.

Section 2

- Correct capital letter in 'Shortwave'.

- Change all ':=' for '='.

Section 3

- In the sentences: 'the solar radiation measurement over a flat homogeneous landscape are well correlated' and 'the correlation between solar radiation measurement decrease', what is being correlated? You are referring to one single variable. I believe you mean that modeled and measured are correlated. Please rewrite this piece. Also correct the grammar to 'measurement decreaseS' or 'solar radiation measurement IS'.

- Same here: 'The SwRB component just estimate' to 'The SwRB component just estimates'.

-'It does not require any calibration, once the four parameters in table 1 are assigned according to literature values.' This is somehow an awkward statement. Sure that by using the values in Table 1 you can estimate realistic radiances, which does not mean that if you calibrate those the results would not be better. But this is the case with almost any model calibration. Please consider rephrasing.

- 'stations into two subgroup:' to 'stations into two subgroups:'.

- Delete the 'say' in (say C-set) and (say V-set).

- What have been the criteria to select the subset used for validation?

- ‘for any of the three basins is applied:’ to ‘for any of the three basins we apply:’.

- ‘result for this step’ to ‘result of this step’.

- Watch italics in all symbols in page 15.

- Change ‘heigth’ for ‘height’ in the entire document.

- Change ‘spheric’ for ‘spherical’.

Results

- ‘Results’ can never be a SUBsection.

- Correct ‘Figures (6) shows’.

- Look at the standards on when to use ‘Figure’ and ‘Fig.’ and the same for the tables. Otherwise try to keep consistency.

- The graphical quality of the flow charts in Figure 1, 3 and 4 needs to be substantially improved. Please increase the size of the font as well.

- Correct ‘hilllslope’ in the caption of Figure 1; also ‘specfied’.

- Table 2, 3 and 4 should be combined. There is no reason to keep them separate; the name of the 3 catchments can be added in a row in the table.

- Correct ‘..’ in Table 2 and 3 captions.

- Same for Table 5, 6 and 8. They can also be combined.

- Table 7 needs to be deleted. It is repeated.

- Watch ‘ ???’ in Table 9. Also ‘adjustement’.

- Figures 5, 6 and 7 are substantially better in quality, but please add a scale to the maps and improve the captions, they need to be much more descriptive (also correct ‘, (Italy).’).

Discussion

- ‘the global shortwave solar radiation showing...’. Two things about this sentence: (a) remove ‘global’, it gives the impression your domain is global (do you mean ‘overall’?), (b) I believe you are looking at solar radiation not just the (large) fraction of solar radiation that can be considered as ‘shortwave’. If you want to use ‘shortwave’ as a synonym to ‘solar’ then avoid using the term ‘solar shortwave’.

- Avoid the use of the apostrophe in ‘components’ structure’; better just use the ‘structure of the components’. Same for ‘components’s framework’.

- The Discussion of the Figures is very limited please extend and try to link the different pieces. Avoid the use of two-sentence paragraphs.

- Please check if the words ‘visualisable’ and ‘identificative’ exist in English. They do not sound very correct to me...

Conclusions

- ‘The goal of this paper was to present a set of hydrological components’. If this was the goal, you did not succeed. This is not the goal. ‘Hydrological components’ by definition are very related to water. Precipitation for instance could be considered as a component of hydrology. Please rephrase.

- As I said at the beginning this piece needs to be more engaging.