

Anonymous Referee #1

This is a very interesting study on PAR measurements.

There are not too many studies on PAR long term measurements and this study is presenting a lot of new and interesting aspects of global and diffuse par

I would suggest the publication of the manuscript after some minor revisions.

We thank the reviewer for the positive comments.

The abstract is overloaded with quantified results and is difficult to follow in the current form. Please shorten it and provide only the main quantified findings in fewer paragraphs.

The abstract was shortened as suggested.

Page 2, line 53 needs a reference.

The reference was added.

Page 3, line 83 add months to the covered dataset period (e.g. Jan 2002 - Dec 2016).

The months were added.

Page 4, line 07 and page 6 lines 68-69 are there any additional uncertainty information (e.g. for hourly MFRSR data) about the angular response in order to exclude data for SZA>80 degrees?

The study by Mizoguchi et al. (2010) shows that above 80° the cosine error may be of the order of 50%. Although the estimated error on the global irradiance is expected to be smaller, it may still be significant (of the order of 15-20% on the hourly mean).

Page 4, lines 20 and 28 provide a sentence explaining to the basics the Langley plot method with a relevant reference and mention the additional AOD uncertainty.

A short description was added.

Maybe Sections 3 and 4 can be under the same Section with potential title "Global and diffuse PAR irradiances". Then, the current section 3 would be 3.1 under the title "All sky conditions" and the current section 4 would be 3.2 under the title "Cloud-free conditions", while the sub-sections will be renamed accordingly (3.1.1, 3.2.1 and 3.2.2 respectively).

The sections were rearranged as suggested.

Section 5 is recommended to be renamed as "Sensitivity analysis"

We do not agree with this suggestion. Maybe only part of section 5 might fall under this title. We have preferred to leave the title "Cloud effects" to this section.

Add grid lines in Fig. 1.

Gridlines were added to figure 1.

link of the long term series with a discussion and details of the calibration series results and uncertainty

This comment is not clear.

Since Lampedusa is severely affected by dust intrusions it would be important to discuss also aerosol attenuation in addition to Cloud attenuation. If the paper is focusing only on cloud effects this have to be mentioned clearly in the discussion or/and in the title. If there will be another manuscript describing the aerosol effects then this has to be mentioned too. Otherwise you can dedicate at least a paragraph on the issue including results of a number of publications on aerosol/dust effects on solar radiation at the site, that authors of this manuscript have investigated in depth in the past.

We are preparing a second paper dedicated to the aerosol influence on PAR at Lampedusa. This was very shortly stated in the paper (page 14, lines 44-45); we have better addressed this aspect in the introduction and in the conclusions.

I would point out more in the conclusions the significance of this study (and PAR and diffuse PAR series, seasonal analysis e.t.c.) for agricultural related applications.

We have added a comment on this topic. At the same time, since measurements used in the paper are obtained in a marine environment, we have also emphasized the potential interest for the estimate of primary production and biological processes occurring in the Mediterranean.

Happy holidays and wishes for a happy new year, to all authors and the editor.

We thank the reviewer and wish the best for the current year.