**Anonymous Referee #2**

This manuscript covers efficiently the topic of PAR from the point of view of statistics information and I suggest to be published in the frame of this special issue. I am quite satisfied with the work and the discussion done about the performance of the used instruments and my overall impression is that the authors have a well-established background about the topic. Eventhough I could accept the manuscript as it is, I would like to make a few suggestions to the authors in order to improve it.

*We thank the reviewer for the positive comments and for the suggestions.*

Page 2, first paragraph (lines 46-49) and second paragraph (lines 50-53): References are needed

*References were added in the first and second paragraph of page 2.*

Figure 1: As I can understand the real slope and the theoretical slope (linear fit) differ more at low zenith angles where the PAR values are higher. Add an analysis about the dependence of the ratio PAR to PARL versus solar zenith angle.

*We have checked that the linear relationship holds for different values of the solar zenith angle. There is some change in the slope with the selected solar zenith angle intervals; the differences are small (the slope changes between 0.99 and 1.07 when different ranges of solar zenith angles are considered) and the overall uncertainty remains within the stated estimates. It must also be pointed out that part of the large spread found for values of PAR above 50 W $m^{-2}$ is due to the role of small time differences between the two observations during cloudy periods. We have redrawn figure 1 removing the fit, which is not used in the analysis and is not discussed in the text.*

Page 6, line 74: "This interannual variability is larger for the diffuse than for the global PAR". Quantify both variabilities and then conclude the above sentence.

*The interannual variability of the annual mean global and diffuse PAR was quantified and discussed.*

Page 6, lines 76-78: “while diffuse PAR displays a more articulated seasonal evolution, with a first maximum in April and a secondary in June”. Give a physical explanation for the two maxima.

*This effect is primarily due to the aerosol seasonal evolution. A sentence was added in the text.*

Figure 11 is useless and complicated. It should be removed.

*We have preferred to leave figure 11. Although it is complicated, is the basis for the discussion of several events which characterize the interannual variability of the cloud radiative effects. We believe that this discussion is useful to interpret the dataset, and would not be supported without the figure.*

figure 12 &13: Since you apply linear regression in order to find the dependence, I suggest to apply multilinear regression for gaining clearer results and safer conclusions.

*We thank the reviewer for the suggestion. We have applied a multilinear regression with respect to the three cloud properties. We have replaced figure 12 and the associated discussions with the results of the new analysis.*

In the future, I hope that the authors should publish a work expanding and combining the findings of the current manuscript with theoretical data (radiation transfer model's outputs). It will be easier to qualify and quantify the factors affecting PAR.

*We thank the reviewer for the suggestion. We are now writing a second paper dealing with the effects of aerosol, based on the cloud-free PAR and aerosol optical properties. The analysis incorporating radiation transfer modelling will be the object of future studies.*