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Atmospheric Chemistry and Physics Discussions

Interactive comment on "A long-term time series of global and diffuse photosynthetically active radiation in the Mediterranean: interannual variability and cloud effects" *by* Pamela Trisolino et al.

Anonymous Referee #2

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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 ÎŹ could accept the manuscript as it is, I would like to make a few suggestions to the authors in order to improve it. Page 2, first paragraph (lines 46-49) and second paragraph (lines 50-53): References are needed 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 zenth angle. 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. 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. Figure 11 is useless and complicated. It should be removed. 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 coclusions.

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.

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