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Atmospheric Measurement Techniques Discussions

Interactive comment on "Improving HelioClim-3 estimates of surface solar using the McClear clear-sky model and recent advances on atmosphere composition" *by* Z. Qu et al.

Anonymous Referee #1

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This technical note presents a new method aiming at improving the accuracy of the retrieval of the solar surface irradiation (SSI) components provided by version 3 of HelioClim (HC3v3). It is based on a new clear-sky model (McClear) using the MACC aerosol, water vapor and ozone products as inputs. The fact that these estimates are available every 3 hours constitutes in itself an important progress as compared to the monthly climatologies used previously. Unsurprisingly, by comparing the new SSI products with reference surface measurements of 23 ground stations, the authors show that at most sites the new version of the method performs better than the former one. Therefore, I fully agree with their conclusion that a systematic correction of HC3v3

with McClear is advisable. From the formal point of view, the note is well written, the methodology is scientifically sound and the results are of interest for a large community of SSI users. In consequence I recommend acceptance of this note after the minors comments listed below have been taken into account. Minor comments and questions: 1) Page 4, line 25: this should be Eq. 3 (not Eq. 5) 2) Page 8, lines 14 and 15. Could the authors propose a physical explanation for the fact that at Tamanrasset the bias is increased with the new method? 3) In lines 7 to 9 of the conclusion, it is said that the it is not necessary to correct HC3v3 at the resolution of 15 min and then sum up to obtain the hourly and daily products, but that the hourly and daily irradiation can be corrected directly. I find it hard to believe that the two types of calculations would yield the same results. Could the authors provide a numerical example supporting their proposition?

Interactive comment on Atmos. Meas. Tech. Discuss., 7, 7793, 2014.