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Biogeosciences Discussions

# *Interactive comment on* "Deriving Photosynthetically Active Radiation at ground level in cloud-free conditions from Copernicus Atmospheric Monitoring Service (CAMS) products" *by* William Wandji Nyamsi et al.

**Anonymous Referee #2**

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Background

In 1999 Nyamsi et al. published in Adv. Sci. Res., 12, 5-10, doi: 10.5194/ a description of an approach to derive PAR under clear sky conditions from the correlated-k approximation of Kato et al. (1999). This approach is computationally efficient, initially applied for calculations of the broadband solar radiation under clear sky conditions in 32 specific spectral bands. The authors used this approach for assessment of the photosynthetically active radiation (PAR) from 400 to 700 nm using twelve of these spectral bands. The method has been evaluated against detailed spectral calculations of PAR



derived with the radiative transfer model libRadtran.

In the present study, the Copernicus Atmosphere Monitoring Service daily estimates of aerosol properties, and column contents of water vapor and ozone are used as input to the method to derive PAR under clear sky condition. The results are compared with measurements of global Photosynthetic Photon Flux Density on a horizontal plane made in cloud-free conditions at seven sites of the Surface Radiation network (SURFRAD) in the USA.

General Comments

1. The methodology used here has been described previously. 2. The methodology has been implemented with actual auxiliary data to match ground observations of PAR. It was found that the bias ranges between 1-6 % from the mean value. It is claimed that these errors are less than 5% than the uncertainty of the measurements. It is claimed that this demonstrates the very good level of accuracy of the proposed method (which is not obvious how). 3. Not clear what is the added value of this evaluation since the methodology itself was already evaluated. Seems, this is just an exercise what is achieved if the CAMS product is used. Would it be worse with other sources of products? 4. Not clear how this work brings us closer to obtain information on PAR under all sky conditions (information that is needed). 5. The approach proposed is not unique and in principle, any radiative transfer model can be used to estimate PAR. Therefore, the unique contribution of the described effort was not demonstrated clearly and neither has it been shown how this gets us closer to obtain large scale information on PAR under all conditions. 6. Relevant references are very limited. 7. Addressing all of above concerns is needed before considering publication.

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