Interactive comment on "A Database of 10 min Average Measurements of Solar Radiation and Meteorological Variables in Ostrava, Czech Republic" *by* Marie Opálková et al.

Anonymous Referee #1

Received and published: 22 January 2018

Review of paper ÂńÂăA database of 10mn average measurements . . ., Czech Republic ÂăÂż by Opalkova et al

General comments This paper presents a newly set-up database of solar radiation plus few meterological and pollutants measurements carried in Ostrava, NE of the Czech Republic. This database has been built by scientists from the University of Ostrava in collaboration with french scientists which expertise in the area of solar radiation measurements and analysis is acknowledged. The sites, sensors used and their maintenance, and the quality checks performed on the raw data and their results are detailed. In particular authors propose a new procedure for checking the quality of irradiances

in specific spectral bands which is an adaptation of procedures used for QC of total irradiances.

Specific comments As I'm not an expert in solar radiation data QC I can not fully judge the validity of the new procedure proposed. I therefore mainly comment on other aspects as rationale, statistics, and form

RationaleÂă: The stress is put on the utility of the measurements set-up as a mean to understand the impact of variations in solar radiation, especially those related to atmospheric pollutants, on vegetation in Ostrava. Have the authors any idea of the surface of the city, presented as industrial, occupied by vegetation and if this is less, in the average or more than similar citiesÂă? Rather than impacting the vegetation in the city itself, don't the authors think that given air-mass movements, the neighbouring areas ie the gardening belt of the city might be impacted and your measurements if representative or extrapolable would be useful to assess also crops sensitivity to variations in PAR due to pollution. Lastly what might be the counter-effect of pollutants deposits vs increase in diffuse radiation on vegetation photosynthetic capacityÂă? Similarly with regards to health issues what might be the balance between a lower exposure to UVA/UVB due to attenuation by pollution vs breathing these aerosols ... I would like the authors to expand a bit their introduction considering these aspects to enhance the rationale of their in-situ measurements.

StatisticsÂă: At the beginning of section 2.1, authors give mean values of sunshine duration air T° . . . first we don't understand if this is for Ostrava or the Czech republic. Second it would have been interesting to provide also these values as obtained from you in-situ measurements even if 3 years are available only. In section 2.2 authors present additional pieces of information provided in the database, in particular the ÂńÂătype of weatherÂăÂż. Yet they do not explain how they have assigned each day to one of the three type of weather. What are the statistics and distance metrics usedÂă? Supervised classificationÂă? Amplitude and variance of the diurnal cyclesÂă? This must be developed and explained. For the information relative to the season I do not

really understand the usefullness of it. Can you explain it a bitᾰ?

Maintenanceᾰ: In section 2.2 authors also describe the way sensors are maintained and the frequency of these maintenances (ech one or two month depending on the season). From the QC performed can you infer that this frequency is high enoughᾰ? How far the measurements rejected by the QC correspond to hours when the maintenance was operatedᾰ? Have the authors the exact dates / hours of maintenanceᾰ? If yes these dates / hours should be reported in the database in a dedicated column so that users can exactly know if the erroneous data (i.e those not passing the QC) are due to maintenance (and maybe do interpolations from the hours preceding / following the maintenance) or an another failure.

Technical corrections

Abstractᾰ: lines 14-17ᾰ: the authors should better stress there that they propose a new procedure for QC of irradiance in different spectral bands (cf beginning of section 3).

Introductionᾰ: page 2 last sentenceᾰ: This sentence is confusingᾰ: we don't understand if you propose to extrapolate the measurements or the procedure to other regions and which ones exactly (what are the ᾶῆᾰregions similarᾰᾰ῎ to Ostravaᾰ?)ᾰ?. please reword.

Measurements sitesᾰ: on the whole I find very difficult to follow / understand what are the sites you speak about along the whole paper. The way you name and call them is confusing. First starting from the map in figure 1 I would label the two sites ᾶῆᾰBGOU (S1, S2)ᾰᾰ῎ and ᾶῆᾰCHMI (S3)ᾰᾰ῎ than 1 and 2. This would be very very helpfull. + add the coordinates on the map. Without these coordinates I can not figure out where is the PHI site (please if possible locate it on the map in figure 1 as well) which is important with regards to atmospheric dynamics and dominant winds ... Pictures of the sites – unless confidential - would be a nice supplementary material to provide on the PANGEA website

C3

For easing the review please do not present a same table on two different pages (a bit annoying) and number the lines with a step of two.

P3 : lines 26-27 : I couldn't find any info about altitude in Tab1 or Fig 1 so delete ᾶῆ (Tab1, Fig1) ῁῎.

P4, line 13 (and elsewhere in the paper)ᾰ: please be more precise about datesᾰ: from the 1st of July 2104 + hour to the 31st of December 2016 + hour (since in some databases records are provided for non complete years).

P5, Line 17ᾰ: as the ᾶῆᾰ2ᾰᾰ῎ stations were only 3m apart

P6, Line 4ᾰ: Within its network of X (? please provide this number) stations, the station the nearest of BGOU is located approximately at 1.7km (GPS coordinates)

P6, Line 11ᾰ: For the sake of simplicity → remove this sentence which is unnecessary here (explanations provided later in the paper)

P6, lines 13 and 14 ᾰ: change ᾶῆᾰCHMI area in Porubaᾰᾰ῎ for ᾶῆᾰCHMI stationᾰᾰ῎ and change ᾶῆᾰthe location in Porubaᾰᾰ῎ for ᾶῆᾰCHMIᾰᾰ῎.

P6, line 19ᾰ: broadband irradiance as exemplified in Fig.2 which presents profiles ...

P7, line 15ᾰ: LibRadtran software (and not a package of software as R or Matlab ...)

P8, line 1ᾰ: for ᾶῆᾰBGOU and CHMI sitesᾰᾰ῎ (instead of both locations)

P9, line 7ᾰ: add ᾶῆᾰ(BGOU) ᾶῆᾰafter S2 and ᾶῆᾰ(CHMI)ᾰᾰ῎ after S3 line 13ᾰ: change for ᾶῆᾰthe station at CHMI (S3) had ... than ᾶῆᾰstations at BGOU (S1, S2)ᾰᾰ῎

P10, last sentenceᾰ: use the plural form. Can these effects be neglected for your study purposes i.e. impact of SR variability on vegetationᾰ?

P11ᾰ: lines 6 – 15ᾰ: move that in a table lines 16-18ᾰ: delete ᾶῆᾰIt means if it ... minimum῁῎. explanations given before in the paper. Line 19ᾰ: ᾶῆᾰareᾰᾰ῎

C4

present + I couldn't find the figures in the files I uploaded. You should rather provide them as supplementary files just as the figure done from google earth which present the shading effect Line 23-25Âǎ: Data Âń̂Âǎof air pollutants and meteorological parametersÂǎ̂Âż measured by …. Âń̂ÂǎthesêÂǎ̂Âż data.

P12, line 5Âǎ:for Âń̂Âǎmodeling thêÂǎ̂Âż influence line 9Âǎ: studied in different environment conditionŝÂǎ: please be more precisêÂǎ: meteorological and air pollution conditions I guess … line 10Âǎ: reword this sentence I don't understand what is a Âń̂Âǎcorrect function of microclimatêÂǎ̂Âż line 11Âǎ: spectral ratioŝÂǎ? Dio you really mean ratios or bandŝÂǎ? If you mean ratio please give example of bands you could use to compute ratios …

Tab 2Âǎ: wonder if you should not split the table into two because it is confusing with regards to the sites where the instrumentys are implemented. For what I understand all instruments belonging to OU are on sites S1,S2 and S3 whereas instruments belonging to PHI are on a site 1.7km from BGOU

Tab 4Âǎ: legend̂Âǎ: numbering your columns would ease the reading of the table. You should also add BGOU and CHMI after S1/S2 and S3.

Fig2. Legend̂Âǎ: please provide the dates of these three days of March 2015 …..