Natural Hazards
and Earth System
Sciences

Open Access

Discussions

Interactive
Comment

Interactive comment on "The European lightning location system EUCLID – Part 2: Observations" by D. R. Poelman et al.

Anonymous Referee #2

Received and published: 24 November 2015

The paper presents an analysis of the lightning flash climatology over 9 years and for a large part of Europe (west-north-south and central). The dataset is provided by the network EUCLID. The anaysis is classical of this type of study, made for other domains and from other networks, insofar the same parameters are considered, and not surprisingly the same results are highlighted. Some interpretations about the densities of

lightning flash observed in the study area for example, miss to make the paper more

scientifically rich. However, some details allow to go beyond what is provided by global detection from space for example. The study deserves to be published, with some corrections, some additional comments and interpretations, and some clarifications.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper

- Abstract, line 11: "proportion" should be better than "numbers".

- A lot of references used in the paper are issued from Conferences, whereas more detailed papers in journal exist with the same results. It is especially true in Introduction section: Krehbiel et al., 1999; Said et al., 2011; van der Velde et al., 2011; Nag et al., 2013; Grant et al., 2012...

- It could be specified which category of location system EUCLID is (frequency range, location technique...).

- page 5359, lines 15-25: for the lightning density values, it would be useful to specify which value is used (average, maximum...) for example for Finke and Hauf (1996).

What does mean "mean flash densities vary between 0.5 and 4 flash km-2 yr-1 in Austria" if it is a mean value, why a range of value between 0.5 and 4? write 4 flashes if it is this value to keep. Same for the values given for Romania, it is not clear which mean value is given. If the density is lower than 2, it is not plural, 0.34 flash and not 0.34 flashes. It should be better to homogenize the unit for the density: flash km-2 yr-1 or km-2 yr-1.

The density is of course calculated over an area (n km x m km for example) and expressed in km-2. The value depends on the values of n and m because it is an average over this area. It could be useful to specify that, when values are given.

- page 5361, lines 12-15: the criteria are not clearly expressed. The first criteria to be tested are interstroke time and space. The criterion of 1 s is not exactly the flash duration... because the flash starts before the first stroke (leader processes etc...). Which time criterion is used at line 19 (probably the same expressed at line 13 Δt).

- page 5361, line 21 and Table 1 : the positive strokes with peak current < 10 kA are removed. In these conditions, why the table 1 gives 95% of positive strokes with peak current > 10 kA? It has to be 100 %, I think?

- page 5362, line 3 : to be corrected with 20 km x 20 km and in other places in the

paper.

- page 5363, line 3 : how is obtained the standard deviation for the monthly activity represented in Figure 2b? What is ±1 SD? Why is it evaluated only for Figure 2b? Why not for Figure 2c and for Figure 2d?

- page 5364, line 17 : if the density is extrapolated at all years, the value is not in km-2 yr-1 but in km-2

- page 5364, line 25 : "the term multiplicity is used.... and depends on the stroke DE..." The value depends on the stroke DE but the term does not depend on DE. To be corrected.

- page 5365, line 17 : is the last sentence necessary? It is not a right synthesis of the two different causes described above (strokes missed and misclassified cloud pulses). The synthesis should be: two causes for the increase of observed single-stroke flashes by EUCLID. . .

- page 5365, line 26 : Do you see an explanation of this observation?

- Page 5367: The observation of the Corsica Island is interesting. It is even a shame not to include the other island (Sardinia) that exhibits same feature. For the comments about the peak current values larger over sea, other studies could be noted: (Seity et al., 2001; Soriano and de Pablo, 2007) for a coastal part of the area of the present study.

Y. Seity, S. Soula, H. Sauvageot, Lightning and precipitation relationships in coastal thunderstorms (2001), J. Geophys. Res., 106 (D19), pp. 22801–22816.

Soriano, L. R. and de Pablo, F.: Total flash density and the intracloud/cloud-to-ground lightning ratio over the Iberian Peninsula, J. Geophys. Res., 112, D13114, doi:10.1029/2006JD007624, 2007.

The same observations were made.

- The summary could be more consistent.

- Figure 3: the unit of CC/CG is not correct, it is not km-2 since it is a ratio between densities... no unit for this ratio.

- Figure 5b: the scale is not right for the last value: correct with > 3.5

- Figure 6a: Why 100% is not reached in the graph at 10 kA for the positive first stroke?

- Figure 8: the comment about this figure is short. Furthermore, the contrast is weaker than with Figure 7. More comments are necessary to explain a weaker contrast. Maybe a graph with the proportion of CG flashes with peak current above 75 and 125 kA should be more significant?

───────────────────

Interactive comment on Nat. Hazards Earth Syst. Sci. Discuss., 3, 5357, 2015.