The authors thank the reviewer for his/her careful run through the manuscript and related comments. Below we have formulated an answer on each point raised by the reviewer.

Anonymous Referee #2

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 analysis 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.

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

Answer: We will change it into “proportion”.

- 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...

Answer: All the references in the Introduction are going to be changed into peer-reviewed journal references. At other places in the text, some references will be removed and others added.

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

Answer: Following will be added at the end of the Introduction: “This network combines time-of-arrival (TOA) and direction finding (DF) techniques at LF to geolocate lightning discharges.” We believe a short description is at place here, since the companion paper ‘The European lightning location system EUCLID – Part 1: Performance validation’ describes the network already in great detail.

- 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.

Answer: In general, average lightning densities are mentioned in the text, unless stated otherwise. We will make this clearer in the text. It is a very good point to mention the grid size the values are based upon.

- 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 13Δt).
Answer: It is certainly true that different processes in the formation of a discharge take place before the first stroke hits the ground. However, it is common practice in the literature to simply group strokes into a flash w.r.t. the position and time of the first observed return stroke. This was originally described as such in the text. Maybe some confusion was made with the term 'time criterion' at p5361 L17 and L19? It is meant the maximum flash duration, thus the maximum time difference between the first and the last stroke of the flash. The text will be slightly changed to remove any confusion.

- 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?
Answer: Well spotted! This has been a small bug in the program. The correct values will be taken into account in Table 1, as well as in Fig. 6a.

- page 5362, line 3 : to be corrected with 20 km x 20 km and in other places in the paper
Answer: In all cases in the text this will be corrected.

- 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?
Answer: 1) The standard deviation has been obtained following a standard procedure, based on the variation in amount of detections for a particular month over the different years. In the same way as the amount of detections per month are expressed in percentages w.r.t. to all detections, a similar conversion factor has been applied to the SD values for each month to express it in percentages. This will be explained in the text. 2) We have opted not to plot SD values in Fig 2c since these are very large and partially caused by the large variability in lightning activity from one storm day to another. In addition, large hourly SD values are found due to the fact that different climates are mixed in this plot (Mediterranean, Alpine, Scandinavia). Adding SD bars in plot Fig2d would reduce the readability of the plot, and are therefore left out.

- 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
Answer: The monthly flash densities are not extrapolated to all years, but from 1 particular month to 1 year. Therefore, the original units [$km^{-2}yr^{-1}$] are correct.

- 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.
Answer: Precisely, we had not expressed this as it should. The beginning of this Section will be changed into: "The term "multiplicity" is used here to indicate the total number of strokes per flash. Its value depends strongly on the stroke DE and adopted algorithm to group strokes into flashes."

- 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 ...

Answer: Correct, we will remove last sentence and slightly change the text into: "Additionally, outliers and misclassified cloud pulses which are not in time and distance close to another stroke further increase the percentage of single-stroke flashes."

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

Answer: We will add following explanation to the text: "This observed increase in multiplicity in latter regions could be related to the augmented estimated peak currents, as discussed in Sect. 3.4. Since strokes with higher peak currents are easier detectable by an LLS, it can explain the multiplicity distribution as plotted in Figure 5b."

- 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.

Answer: Point well taken. Sardinia will be taken into account and included in the zoom-in of Fig. 7c/d and some discussion added to the text. In addition, a reference to Seity et al. (2001) will be made.

- The summary could be more consistent.

Answer: Definitely, the summary deserves some more attention. We will expand this section as follows

"Due to the variable nature of lightning occurrence from year to year, reliable insights into the lightning activity and parameters can only be achieved when based on large amounts of data. In this work, a total of 32 million CG flashes recorded in between 2006 and 2014 are used to analyze the spatial and temporal characteristics within the EUCLID domain.

It is found that the lightning activity primarily takes place between May and September, accounting for about 85 % of the total observed lightning activity. From October onwards the activity over mainland Europe decreases gradually, while on the other hand the activity over sea, especially the Mediterranean Sea, increases in magnitude as a result of residual heat stored in the water. The thunderstorm season reaches its peaks in July within the complete EUCLID domain. As regards the average diurnal flash counts, those are lowest during the morning hours, followed by a continuous increase from 10:00 UTC up to 15:00 UTC. However, it is worth noting that this diurnal behavior combines observations of lightning activity both over land, sea and even different climates such as the Mediterranean, Scandinavian, and Alpine region. It is thus highly possible that those particular regions exhibit particular features that are removed when averaging over the EUCLID domain.

Average annual ground flash densities vary from less than 0.01 flash km^{-2}yr^{-1} in North Scandinavia to a maximum of about 6 flashes km^{-2}yr^{-1} at the triple point between Austria, Italy and Slovenia, based on a spatial grid resolution of 20 km x 20 km. Between the aforementioned extreme values, a multitude of different flash densities exist within the EUCLID domain, with in general higher values in the east.

It is found that the average absolute peak current of all detected strokes display a monthly dependency, with the largest estimated peak currents observed in between November-March. Moreover, a clear discrepancy is noticed between the observed peak current distribution over land and sea, favoring higher peak current flashes over sea. For the first time, this effect has been demonstrated not only to occur along the coast but in addition over Corsica and Sardinia. This can explain as well the higher multiplicity observed in the Mediterranean sea, since individual strokes with higher peak currents tend to be easier detected.".

- 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.
Answer: Yes, we will correct this in the text.

- Figure 5b: the scale is not right for the last value: correct with > 3.5
Answer: Scale will be changed as suggested.

- Figure 6a: Why 100% is not reached in the graph at 10 kA for the positive first stroke?
Answer: Related to your previous point, it was caused by a small bug in the program. The Figure will display the correct values.

- 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?
Answer: 1) Whereas Fig. 7 deals with peak currents (and in particular the 95th percentile in Fig. 7b/c/d), Fig. 8 displays the flash density [km^{-2}yr^{-1}] for CG flashes with peak currents above a certain level. Therefore, one should be careful with a direct comparison between Fig. 7 and 8. However, we feel that Fig. 8 clearly displays the fact that the flash density for flashes with Ip>75 kA is lower over Sardinia (for example) by a factor of ~2 or more then the flash density in the sea surrounding the Island. Likewise, the amount of flashes with Ip>125 kA over Sardinia is negligible, whereas those are observed in the sea close by. The effect is thus still visible, but presented in another way as in Fig. 7. The comments about this Figure will be expanded in the text. 2) As can be retrieved already from the cumulative statistical distribution of return-stroke peak currents in Fig. 6a, only a fraction of the flashes exhibit peak currents above 75kA or 125kA. As such, the flash densities found in Fig.8a/b are quiet low.