

Interactive comment on “Analysis of the lightning production of convective cells” by J. Figueras i Ventura et al.

Anonymous Referee #1

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The paper “Analysis of the lightning production of convective cells”, by Figueras i Ventura and colleagues, presents a radar-based study on the lightning production capabilities of convective cells occurred in summer 2017 in Switzerland. Weather C-band, Doppler, polarimetric radar reflectivity data are processed to automatically detect and track convective development, while lightning data were recorded from the EUCLID network, and from a Lightning Mapping Array VHF network, deployed for this campaign. The main results is that the altitude of rimed particles column is a promising predictor of lightning activity in convective cells, especially for Intra Cloud flashes: cells with less lightning activity had a shallower column, a lower proportion of hail and in general lower reflectivity values and higher values of co-polar correlation coefficient, indicating smaller and more homogeneous particles.

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The paper is well written and addresses an important topic, contributing with new data and experiments. I think the paper should be published on AMT, after the minor corrections I suggest below.

Introduction. I think the literature review does not consider relevant papers that analysed convective systems lighting activities and cloud microphysical structure: e.g. Emersic et al., 2011, Mon. Wea. Rev., 139, 1809–1825, Wapler, 2017), Atmospheric Research 193, 60-72; Marra et al, 2017, Atmospheric Research, 192, pp. 72-90; among others.

Pag. 6. Lines 9-10. How are the number of EUCLID and LMA computed for each cell? In should be done when the cells are in the reduced domain. This figure should be discussed with more details.

Pag. 8 line 28 and following. I do not understand how figures 14 and 15 are drawn. In abscissa it is time, but looking at the pictures especially for cell 2, it seems that PPI beams show up in the right part of the figure. What does it mean that (for cell 2) at 8000 s the cloud has layers with no hydrometeors? I general I suggest to better comment these figures, and to use labels to better mention them in the text.

Conclusions. The first item is not a conclusion: Authors just say that the two systems measures different things in different places. A careful detection efficiency study of the two networks should be made before the intercomparison.

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