

Interactive comment on “The temporal evolution of three-dimensional lightning parameters and their suitability for thunderstorm tracking and nowcasting” by V. K. Meyer et al.

Anonymous Referee #1

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General comments

The manuscript investigates the temporal evolution of 3D lightning characteristics of thunderstorm cells and correlates them with the cell-parameters lifetime and cell area. This is done on a statistical basis using a 3D lightning data set recorded during five summer months in southern Germany. The lightning data provided the discrimination between IC/CG stroke and IC stroke heights inside the thunderstorm cells. Three case studies were also thoroughly investigated using volumetric radar data. To perform the study a newly developed lightning-cells tracking algorithm was applied to the lightning data set. The correlations discussed in this work show the presence of two different

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discharge regimes depending on the cell area and allowing the discrimination between rather simple and short-living thunderstorm cells and more complex, longer living cells.

The manuscript is scientifically interesting, well-written, and should be accepted for publication after the author addresses some minor concerns outlined below.

Specific comments

- p. 2222, line 8-9: The ability of the lightning-cells tracking algorithm to nowcast the future cell positions could be an interesting subject for an additional application study of the developed system.

- p. 2222, line 16: "...maximum search radius of 7 pixels...": radius or diameter? Please compare p. 2186, line 22 in the companion paper ("Automated thunderstorm tracking: utilization of three-dimensional lightning and radar data") and clarify.

- Fig. 1b caption: "...with standard deviation...": please clarify.

- Fig. 2 caption: "The first three cell entries are marked yellow...": it is difficult to identify the first three cell entries.

- Fig. 2 caption: "...indicated by green arrows...": please add the green arrows in the figure.

- Fig. 3: Please indicate the azimuth angle and the recording time of the RHI.

Technical corrections

- None

Interactive comment on Atmos. Chem. Phys. Discuss., 13, 2217, 2013.

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