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Atmospheric Chemistry and Physics Discussions

Interactive comment on "Automated thunderstorm tracking: utilization of three-dimensional lightning- and radar data" *by* V. K. Meyer et al.

Anonymous Referee #2

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General comments

The manuscript proposes a new technique for an automated identification, tracking and monitoring of electrically charged thunderstorm cells. The new hybrid method is based on the combination of two independent algorithms. The first uses an already existing radar-cell tracking routine, whereas the second is a new method to identify electrically active thunderstorm areas. The combination of radar- and lightning-cells allows it to follow a thunderstorm cell also if it is identified only by one of the two methods and therefore permits an improvement of the overall tracking performance.

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

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Specific comments

- p. 2183, line 9: Some radar-cells tracking algorithms simply use the maximum reflectivity to identify the cells. Here low level radar scans are used to identify intense ground precipitation fields. Are there some specific reasons to prefer this approach?

- p. 2184, line 12: The total lightning dataset shows respective fractions (60% : 30%) of IC $\approx$ twice CG. On the other hand the IC fraction for the 25 June case study shows in Fig. 9 (c) a higher IC fraction then the full dataset. Could you please comment on this apparent difference?

- p. 2189, line 15-16: The potential of the proposed technique for thunderstorms cell nowcasting would be an interesting issue for an additional study.

- p. 2194, line 25-26 and p. 2199, line 21-24: Is there a possibility for an early detection of future severe cells based on the identification of pure lightning cells before the first detection as a radar-cell?

- Fig. 1 caption: "...(blue shaded with reflectivity values above the detection threshold colored yellow)...": in line 17, p. 2187 the reflectivity threshold is defined as 33 dBZ.

- Fig. 4: Please indicate the azimuth angle of the RHI. In the PPI plots the IC and CG events are hard to see.

- Fig. 5: Cell centers, cell numbers, cell tracks and CG/IC are hard to see.

- Fig. 8: Please indicate the meaning of the blue dots.

- Fig. 9(a): Please clarify the scale for the overshooting top height.

- Fig. 10: Please indicate the azimuth angle of the RHI.

Technical corrections

- p. 2186, line 6-7: change to read: "...satellite data (Zinner et al., 2008)."

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