

## Point-to-point response

By Jianguo Wang, Si Cheng, Li Cai

First of all, the authors wish to thank all reviewers for the comments which significantly improved the content of the manuscript. The authors have addressed all the comments raised by the reviewer and incorporated them in the revised manuscript wherever required.

### **Reviewer Comments:**

#### **#Reviewer 2**

This paper titled "Characterizing the dynamic movement of thunderstorms using VLF/LF total lightning data over the Pearl River Delta region" discusses the use of lightning data to track and analyze the movement of thunderstorms in Southern China. The authors did a nice job responding to all of my comments. The paper looks much better and is close to ready for publication. However, their comments did reveal one important issue that needs to be addressed before it can be published. There I suggest minor revisions.

#### Authors' Response

The authors thank the reviewer for providing all the suggestions and sincerely accept that these have turned out to be indispensable in pushing and improving the standard of the current work.

In the response to my comment regarding flash clustering information, the authors state that they do not do any flash clustering and use the individual pulses detected by the FTLLS in their thunderstorm data. However, on many occasions they are using "flash" (e.g., lines 111, 135, 206, 284). If there is no flash clustering occurring, then this is not an accurate statement. They authors should use event, not flash. Furthermore, this means that this study cannot compare to other studies that use flash rate/total since there are many pulses per flash. The authors need to read through the paper and eliminate any use of flash when referencing this dataset.

#### Authors' Response

The authors would like to express our appreciation for the reviewer's suggestions. We have read through the paper and revised the corresponding description of the lightning event. We have also deleted the flash-related reference in the manuscript.

#### Comments by line #

Line 90: My previous comment was not related to the detection efficiency of the system, but the classification accuracy. Since there are results that use IC vs CG, I would like to see some results related to the classification accuracy.

#### Authors' Response

Thanks for your comments. The classification accuracy of a total lightning location system is usually obtained by comparing it with other total lightning location systems. However, as we have stated, the FTLLS in this study is the first total lightning location system over the PRD region. So, there is no other LLS to compare with. We believe

that more total lightning location systems will be established in China and related research will be done in the future. Meanwhile, we have already shown that the detection of CG is accurate by comparing it with the triggering lightning result and transmission line fault (Line 89-91).

In addition, the classification accuracy of IC and CG has little influence on the result of the thunderstorm movement, because the tracking of thunderstorms was done by the total lightning events.

Line 113: This wording is still not clear. " is in progress " sounds like it is not complete and will be done in the future.

**Authors' Response**

Thanks for your comments. We have revised the sentence to make it clearer.

*The time interval of 12 min is twice of the Doppler Radar scans, with which the routes of thunderstorms can be tracked precisely without losing kinematic features.*

Line 296: You still do not state what the average is for the current study, which would make it much easier for the reader to compare rather than having to look back in the results.

**Authors' Response**

Thanks for your comments. We have added the average duration of thunderstorms in this study.

*The lifetime was between 54 minutes to approximately 8 hours, with the average duration of the whole thunderstorm evolution process being about 3.5 h, which is slightly longer than this study (2.93 hours)*