Review of the manuscript entitled “Impacts of aerosols on weather and regional climate over the Pearl River Delta megacity area in China” by Wang et al. submitted for possible publication in the ACP

Comments:

The subject is appropriate to ACP. This manuscript presents the results of analysis of seven-year measurements of precipitation, lightning flashes, and visibility from 2000 to 2006 in the Pearl River Delta (PRD) region, China, with a focus on the Guangzhou megacity area. The study found that the occurrence of heavy rainfall 5 (>25mm per day) and frequency of lightning strikes are reversely correlated to visibility during this perio. It was also found that elevated aerosol loading suppresses light and moderate precipitation (less than 25mm per day), but enhances heavy precipitation by model simulation and there were more efficient mixed phase processes and intensified convection under the polluted aerosol condition. This research is very interesting and important. This paper is well-written. Therefore I recommend clearly the acceptance for publication of this manuscript in ESPR after minor revisions. Several editorial comments for improving the information content and presentation of the paper are listed as follows.

1. P23292, 4. Conclusions: It will be better to mention the weakness of the work that has not used the real aerosol field from air quality model for the study region and time window. Since authors mentioned that authors will carry out further modeling work to examine the impacts 5 of aerosols on different types of convective system in the PRD area, such as typhoons which also contribute to heavy rainfall and lightning formation, I feel that authors should consider use the real aerosol field as well in future.
2. P23307, Figure 7: it is not clear which one is (a), (b), (c) and (d) from the figure. Please redraw Figure 7.