Interactive comment on "Aerosol-induced changes in the vertical structure of precipitation: a perspective of TRMM precipitation radar" by Jianping Guo et al.

Anonymous Referee #2

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Review of "Aerosol-induced changes in the vertical structure of precipitation: a perspective of TRMM precipitation radar" by Guo et al.

Taking the Pearl River Delta region of China as the study area, this paper reported the observational evidence of aerosol effect on precipitation using TRMM and PM10 datasets. Different precipitation types or regimes in particular the vertical structure of precipitation are differentiated for more explicit explanation. The findings from the study are convincing, and the technical details are sufficient to support the results. The impacts from other meteorological factors are also discussed in order to single out the aerosol effects on precipitation. The study is at the frontier of this research field, and I

highly recommend the paper is published in ACP at current format. I only have a few minor comments and suggestions for the authors to consider if they are going to revise the paper further for improvements: 1. Page 6 L24: problems -> considerations? 2. Page 7 Line 25: tercile -> terciles? 3. P7L26: dirtiest -> most polluted? 4. P7L27: bins -> terciles? 5. Table 2: would it be possible to add PM10 information in this table as well? Such as Mean and Standard Deviation of PM10 for Clean and Polluted terciles? 6. Page 8 L5-7: will such definitions of clean and polluted conditions match the terciles with each tercile having same number of samples? 7. Figure 1 caption: is PM10 in (a) collected over the same period of Pm2.5? If not, it is better to be specific. 8. Figure 2 reminds me how the seasonal cycles in the datasets are treated. For example, PM10 are collected from different months, did you deseasonalize the datasets before the three terciles are determined? This will help avoid high tercile Pm10 are mostly collected from one season, and low tercile are from another season. It is therefore worthwhile and critical to check whether your samples from each tercile are biased to seasons. 9. P13 L12: Figure4c -> Figure 4(c) 10. PM10 datasets availability: Did PM10 data end in December 2012 and then replaced by PM2.5 in 2013? Why we don't have any PM10 any more after 2012 to extend the study period longer? It is strange they stopped measuring PM10 after they switched to PM2.5 in 2013. 11. Figure 6: did you conduct the similar thing for shallow and stratiform precipitation? 12. Figure 7 and 8: I am not sure I understand them completely. But I do like the discussions associated with them. Great work!