

Comments on the manuscript "Analysis of the formation of fog and haze in North China Plain (NCP)" by J. Quan, Q. Zhang, H. He, J. Liu, M. Huang, and H. Jin

General comments:

This paper investigated the long-term trends of fog and haze over NCP region and compared their decadal variations between urban and rural sites. In addition, the impact of aerosol loading on the typical fog occurrence, as well as the role of fog droplets and aerosol hygroscopic process on visibility degradation have been discussed in detail by in-suite measurements including meteorological and microphysical parameters.

These works are very necessary for investigating the increasing low visibility events in China, especially in large cities, which are experiencing the rapid social and economic developments.

This study is based on solid data and sound research approaches. The impact of aerosol loading on fog occurrence and visibility deterioration is clearly demonstrated. In my opinion, this paper is acceptable for publication with minor revisions as detailed in the following specific comments.

Specific comments:

1) Page 11914, line 1, the author had best describe the visibility data applied in the trend analysis of fog and haze in more detail, Are those data from instruments or observer? what's the frequency?

2) Page 11914, the criterion of visibility and RH used to determine haze and fog is different from the haze observation standard issued by CMA in 2010 (QX/T 113-2010). So the author should highlight the criterion in this paper, such as what's kind of the visibility and RH data used in haze and fog determination, hourly or daily?

3) Page 11915-11916, the author mentioned that the OHAZ

days at the rural sites were lower than that at the urban sites, which was attributed to aerosol loading result from economical developments. What's the difference of OFOG days between urban and rural sites?

4) Page 11928, in fig. 1, the illustration is not consistent with the symbols in the figure and the descriptions in page 11913.

5) Page 11915, during the 4 periods of OHAZ variation described in fig.3, if the impact of sand storm which has important role on visibility has been considered?

6) Page 11929, in fig.2, the y-axis should be "days/year", while not "haze day/year".