

[Interactive
Comment](#)

Interactive comment on “Aerosol hygroscopicity parameter derived from the light scattering enhancement factor measurements in the North China Plain” by J. Chen et al.

Anonymous Referee #2

Received and published: 31 March 2014

In this manuscript a retrieval method was proposed to calculate the aerosol hygroscopicity parameter κ , based on aerosol light scattering enhancement factor $f(\text{RH})$ and particle number size distribution during HaChi campaign. The CCN number concentration was estimated by using the derived κ . The method is straightforward and useful to estimate κ and to predict CCN concentration. However, several corrections and clarifications are necessary to improve the manuscript. Some discussions in the manuscript need to be better organized. The authors also need to polish the English to void colloquialism. I suggest that the manuscript may be publishable in ACP after revisions listed below. Specific comments: In the introduction, it needs to be discussed that parti-

[Full Screen / Esc](#)

[Printer-friendly Version](#)

[Interactive Discussion](#)

[Discussion Paper](#)



cle morphology can also vary considerably with atmospheric aging and RH, impacting the particle optical properties (i.e., Khalizov et al., J. Phys. Chem. 113, 1066, 2009; Pagels et al., Aerosol Sci. Tech. 43, 629, 2009). In particular, how particle morphology variation may impact their algorithm to derive κ with the f(RH) measurements. âĀĀ Page 3463 Line 5-7. Need to cite several references to discuss the particle pollution in NCP. Need to show numbers, e.g. particle concentrations. âĀĀ Page 3463 Line 23-30. It is unnecessary to describe the contents in every section. Just describe what you have done and why that's important. âĀĀ Page 3463 Line 23-24. " . . .observation. . .were analyzed" âĀĀ Page 3464 Line 10-11. Clarify the measurement period. The campaign was conducted from October to January? But the authors only showed the January data. âĀĀ Page 3465 Line 20. If possible, show the inter-comparison at high RH. As in the discussion afterwards, the CCN comparisons are different at low RH and high RH. âĀĀ Page 3465 Line 18-19. The Neph measurement should be introduced briefly, not only citing references, e.g how RH is changed during each cycle (Page 3467 Line 8-11 should be moved here), etc. âĀĀ Page 3465 Line 25. Explain why weak hygroscopic growth of particles at low RH can lead to high discrepancy at high σ condition. âĀĀ Page 3466 the first paragraph. Re-organize this paragraph. The episodes should be described either by time or types (polluted and clean), e.g., the authors recognize the two pollution episodes, and then descriptions of these two pollution episodes should be made. âĀĀ Page 3467 Line 8-11. Move this part to the experimental section. âĀĀ Table 1. List σ for pollution and clean episodes, so that the readers can have the idea of what was the situation in pollution and clean episodes. âĀĀ Page 3468 second paragraph. The authors may want to discuss the light extinction, but did not reach any conclusion. If the authors have absorption data or extinction data or visibility, discuss all these data to investigate how much the particle hygroscopicity can affect the visibility. âĀĀ Table 1. Is the average value for the whole measurement period or just for the clean and pollution episodes? It makes little sense to average only pollution and clean episodes. âĀĀ Page 3472 Line 11. ". . .would be great" colloquialism. There are several English style issues in the manuscript. âĀĀ Section 3.4 Uncertainties in κ estimation should be

[Full Screen / Esc](#)[Printer-friendly Version](#)[Interactive Discussion](#)[Discussion Paper](#)

discussed. The authors discussed the uncertainties in section 3.5, but the discussion should be moved here. Figure 2 is unclear.

Interactive comment on Atmos. Chem. Phys. Discuss., 14, 3459, 2014.

Full Screen / Esc

Printer-friendly Version

Interactive Discussion

Discussion Paper