

Interactive comment on “Vertically resolved concentration and liquid water content of atmospheric nanoparticles at the US DOE Southern Great Plains site” by Haihan Chen et al.

Anonymous Referee #1

Received and published: 10 August 2017

The manuscript presents important novel measurements of the concentration and liquid water content of atmospheric nanoparticles as a function of altitude. The authors do an excellent job of identifying and testing the assumptions in their analysis. Please consider the following comments:

(1) Page 2, bottom paragraph: It is interesting to consider the authors' results in light of a contemporaneous 2017 ACPD manuscript from Andreae et al., who observed NPF in the upper troposphere of the Amazon and condensational growth in the planetary boundary layer. The authors brought up earlier measurements from SATURN and southern Finland but missed helicopter/aircraft studies in the remote summertime Arc-

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tic (e.g., Kupiszewski et al., ACP 2013; Burkart et al., ACP 2017) that found ultrafine particles near the surface, with much lower concentrations in the free troposphere.

(2) Page 4, lines 25-27: What were the explicit size ranges for each CPC? What is the uncertainty associated with the 11-16 nm size window?

(3) Figure 2: The grey and white colors in the legend are reversed.

(4) Captions for Figures 3 and 5: "Tethered" is misspelled in line 4.

(4) In section 3.1, how representative are the two days for general conditions at the site? How do they compare to the other days simulated in Figure 9?

Interactive comment on Atmos. Chem. Phys. Discuss., <https://doi.org/10.5194/acp-2017-586>, 2017.

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