Atmos. Chem. Phys. Discuss.,
https://doi.org/10.5194/acp-2017-586-RC2, 2017

Atmospheric Chemistry and Physics Discussions

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 #2

Received and published: 26 September 2017

The paper presents an important topic, the vertical profile of new particle formation and further estimates and speculates on the LWC of these newly formed particles. The paper uses two CPCs of different lower cut-off size for the profile measurements of 11-16 nm particles. Further on the authors take advantage of the ground level SMPS and HTDMA measurements and a model. The paper is clearly written and the presentation of results is well performed explaining the assumptions needed and uncertainties in the analysis. Still, I recommend the authors to consider the following comments.

General Comments:

- Could you justify the selection of 11-16 nm range for the profile measurements?

- As the profiles are measured with 11-16 nm particles, the observed particles are the particles that have been growing 1-3 hours after the actual onset of the NPF event itself. Does this affect the analysis and what kind of uncertainty this brings in?

- Based on the fact above, as the 11-16 nm particles have been first observed at well above ground level, could it be that this is due to a larger growth rate from 1 nm to 11 nm at this altitude, and also more intense burst of particles?

Specific comments:

- Page 4, rows 3-20: Are the particles measured with the profile CPCs and ground-based SMPSs dry or wet/ambient?

- Page 6, row 3-11: Please mention the used HTDMA diameters already here.

- Page 10, row 24: How much did the hygroscopic growth factor and Kappa-value varied throughout the period and especially on the case days 12-13 May?

- Figure 2: The legend and figure caption colors do not match.

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