

## ***Interactive comment on “Aerosol Effects on the Development of Cumulus Clouds over the Tibetan Plateau” by Xu Zhou et al.***

**Anonymous Referee #2**

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This study seeks to show the relationship between aerosol loading and deep convection within the Tibetan Plateau region and compare with the North China Plain. Model simulations are used to show the sensitivity of deep convection to various concentrations of aerosol loading. I believe this paper can be published after several grammatical errors and some technical questions are addressed. For most of the grammatical error revisions please see the attached PDF.

How confident are you in the aerosol assumptions used as input to your model? Aerosol chemistry is relevant when certain aerosols activate as CCN. Also, emission data is important since the Tibetan Plateau does not often witness heavy aerosol loading events, though you are correct about the summer season having the most polluted conditions. Also, coarse mode aerosols (mineral dust) tend to dominate that region throughout the year.

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Do you expect to see much sulfate in the Tibetan Plateau? And if so, how does that compare to the ability of carbonaceous aerosols to activate as CCN since they too can be observed over this region.

I have no problems with the results you show from your model but both comparison regions should be equivalent. It seems that topography plays a large role in the development of deep convection over the Tibetan Plateau. I believe your point is that the monsoon may be affected by aerosol-cloud interactions over this region. However, is it fair to compare aerosol impacts on storm development in the Tibetan Plateau region with the Northern China Plains where the topography is not only flatter but there are more sources of aerosol loading as well.

Please also note the supplement to this comment:  
<http://www.atmos-chem-phys-discuss.net/acp-2017-148/acp-2017-148-RC2-supplement.pdf>

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Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2017-148, 2017.

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