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Interactive comment on "Water adsorption and hygroscopic growth of six anemophilous pollen species: the effect of temperature" *by* Mingjin Tang et al.

Anonymous Referee #2

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The hygroscopicity of pollen species is not well-recognized. The authors investigated six different type of pollen particles using two methods. This work provides valuable dataset for hygroscopicity study community. I have two major comments, which should be addressed and implemented in the revised manuscript. Afterwards, I would like to review another round. (1) In 3.2.1 Theories, the authors assumed the pollen grains are spherical, then, build the link between kappa and mass hygroscopic growth. While, the pollen gains may not the case and are porous in real world. Assuming a spherical particle could lead to a big bias, for example, higher increase in mass, but, smaller hygroscopic growth in diameter. Actually, the mass growth is significant, but the kappa is very small value compared the atmospheric secondary organic aerosols. The authors

only mentioned in line 362-364 that porosity and internal structure, might play an important role in determining the hygroscopicity of pollen grains. But no any discussion in theory part. A detail discussion on the non-spherical situation and its effects on the relationship between kappa and mass growth should be given. (2) For the kappa theory proposed by Petters, 2007, the particles being studied should be assume as solution. Differently, Freundlich adsorption isotherm is water adsorption by materials. The principles between two theories are quite different. The authors may clarify the purpose by using two different theories to fit the observed curve. Which method is more suitable to explain the water uptake of pollen?

Interactive comment on Atmos. Chem. Phys. Discuss., https://doi.org/10.5194/acp-2018-1118, 2018.