

***Interactive comment on* “Effect of the exclusion of
crystal ions (Ca^{2+} , Mg^{2+} , and K^{+}) in estimating
water content of $\text{PM}_{2.5}$ at polluted and clean areas”
by Hyung-Min Lee and Yong Pyo Kim**

Anonymous Referee #2

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In this study, authors explored the effect of crystal ions (Ca^{2+} , Mg^{2+} , Na^{+} and K^{+}) on aerosol water content using gas/aerosol equilibrium model, in Seoul and Gosan, Korea. The research was focused on understanding of how $\text{PM}_{2.5}$ water contents responding to the crystal ions. The results show that removing the crystal elements tends to influence modeled aerosol water content. The motivation of this study is that the observations were used as input to the model. But the problem is that there are no water content measurements during same time periods and location, which can be used to validate the model’s results. This manuscript can be accepted for publication after major revision.

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Interactive Discussion

Discussion Paper

Comments: 1. Authors should evaluate these historical datasets first, including mass closure, charge balance, and assess how well of the data are and how important effects of those missing components (not measured but important) on model calculation. 2. Compile available water content measurements and compare them with authors' results, to get roughly scope of aerosol water content at similar circumstances. 3. As authors stated that "removal of crustal ions affect not only in water content but also inorganic salts composition with possible reasons". Authors should discuss more about at what circumstance the change could be due to phase shift (between the solid and aqueous phase) and at what circumstance the change is because of hygroscopicity variation (the change of inorganic composition remaining in the same phase). 4. The manuscript requires language editing and checking.

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