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Supplement of

Uncertainty in aerosol hygroscopicity resulting from semi-volatile organic compounds

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1 Supplementary material

In the main body of the paper, we discuss the effects of SVOCs on the hygroscopicity of non-volatile aerosol modes. Although four different chemical compositions of the particles are considered, only one size distribution is used. In this supplement, we briefly discuss the effect of using different aerosol size distributions of ammonium sulphate on κ_{SVOC} . We have varied one
5 parameter at a time while using the mean values stated in the main paper for the other two parameters. Figure 1 shows the variation of κ_{SVOC} with number concentration. A notable dependence is observable with a trend for lower κ_{SVOC} values at higher number concentrations. The uncertainty also decreases with increasing number concentration. Figure 2 shows the dependence of κ_{SVOC} on the geometric standard deviation. Lower κ_{SVOC} values are observed at low and high values of the geometric standard deviation. It is possible that the values that give the largest κ_{SVOC} values, in this case 0.5, may depend on
10 the median diameter. This will be investigated further in future work. The dependence of κ_{SVOC} on median diameter is shown in Figure 3. Little variation in mean κ_{SVOC} can be observed although the uncertainty reduces by a factor of 2 when the median diameter is increased from 50 nm to 200 nm.

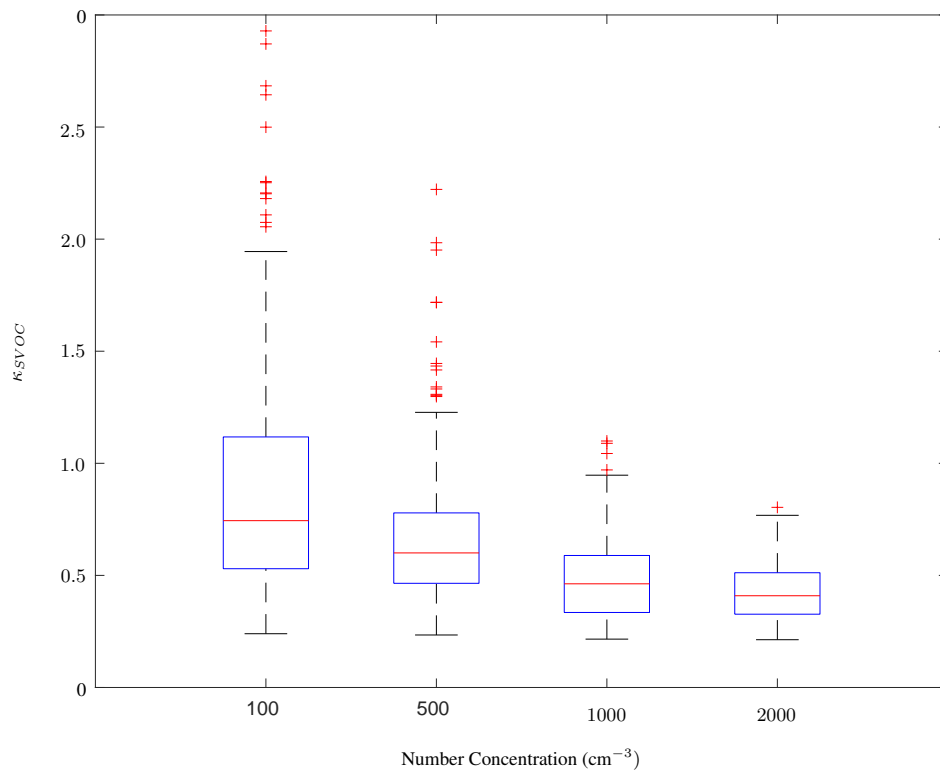


Figure 1. κ_{SVOC} values of ammonium sulphate at a range of mean number concentrations

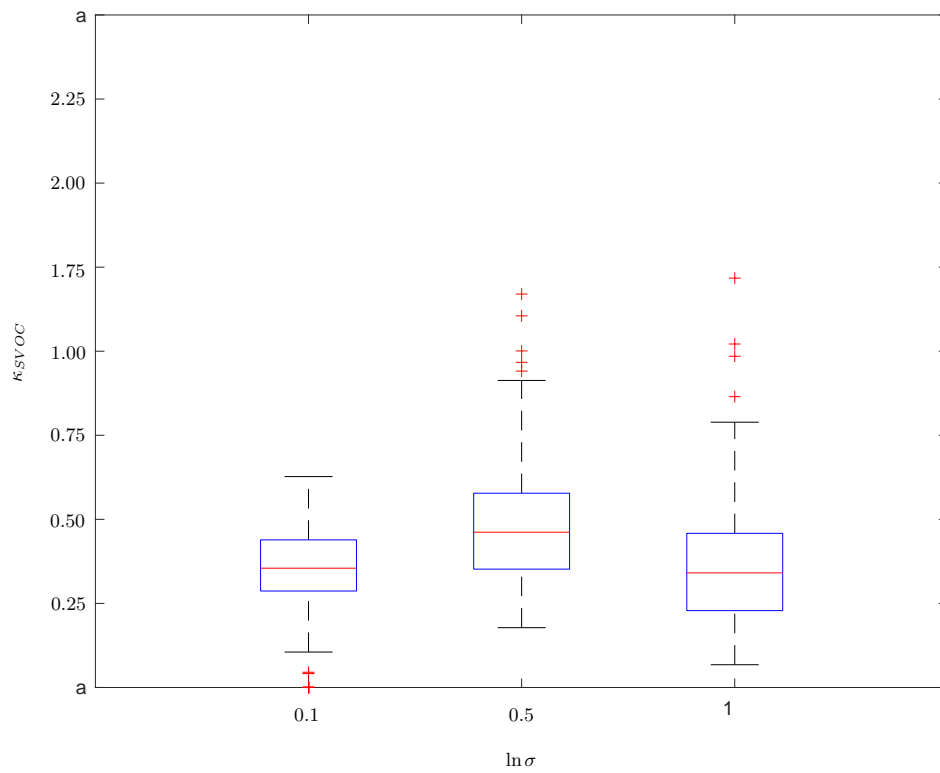


Figure 2. κ_{SVOC} values of ammonium sulphate at a range of geometric standard deviations

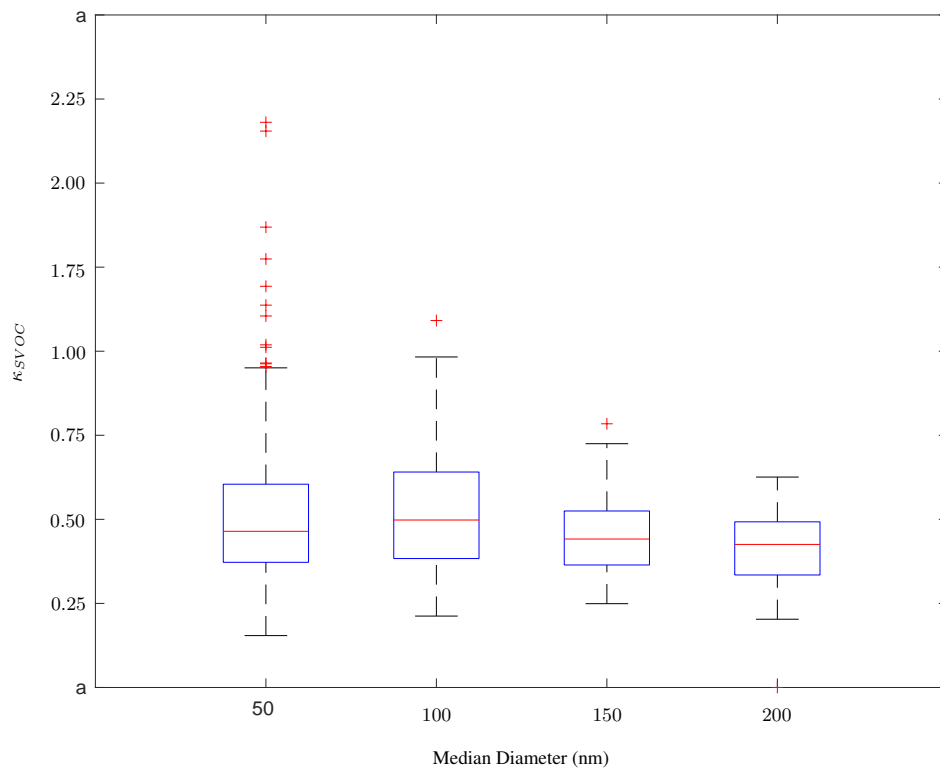


Figure 3. κ_{SVOC} values of ammonium sulphate at a range of mean median diameters