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Atmospheric Chemistry and Physics Discussions

Supplement of

Particle water and pH in the Eastern Mediterranean: sources variability and implications for nutrients availability

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1. Parameterization between hygroscopic growth factor and RH

Based on the ambient and dry scattering coefficients measured by the two nephelometers, a link between the *f(RH)* and RH is established taking into account all data from the measurement period:

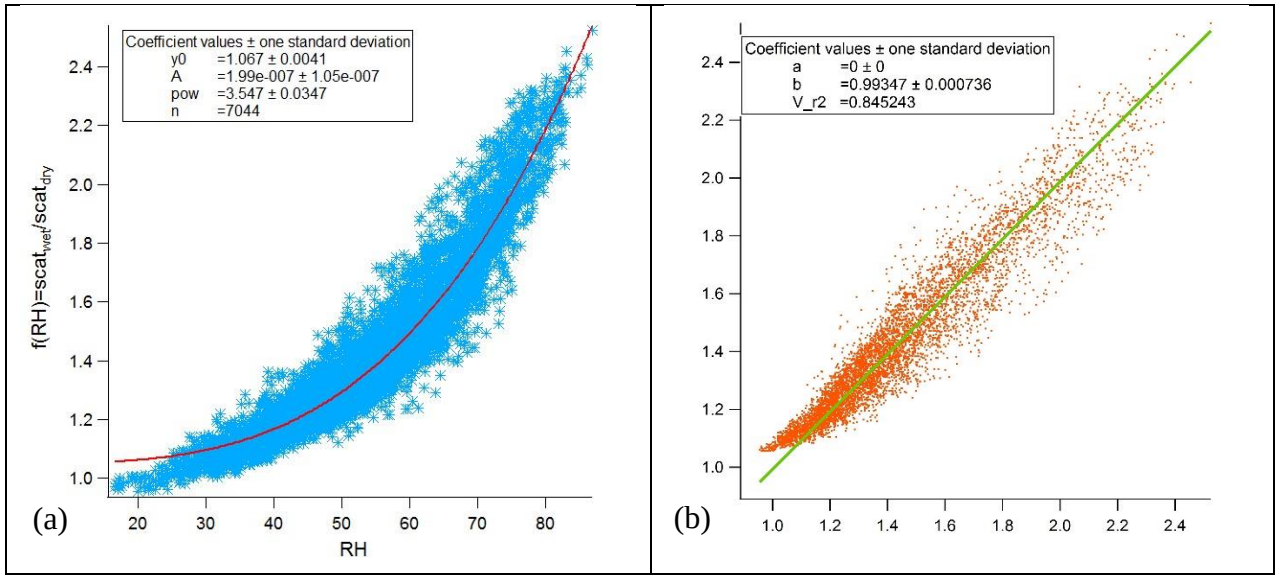


Figure S1: (a) Correlation between *f(RH)* and RH taking into account all available data from the ambient and dry nephelometers, and (b) Correlation between actual and reconstructed *f(RH)* values.

Using the derived parameterization $f(RH) = 1.067(\pm 0.004) + 1.99(\pm 1.05) \cdot 10^{-7} RH^{3.547(\pm 0.035)}$ the reconstruction of the measured hygroscopic growth factor is realized, with values being within 15% of one another.

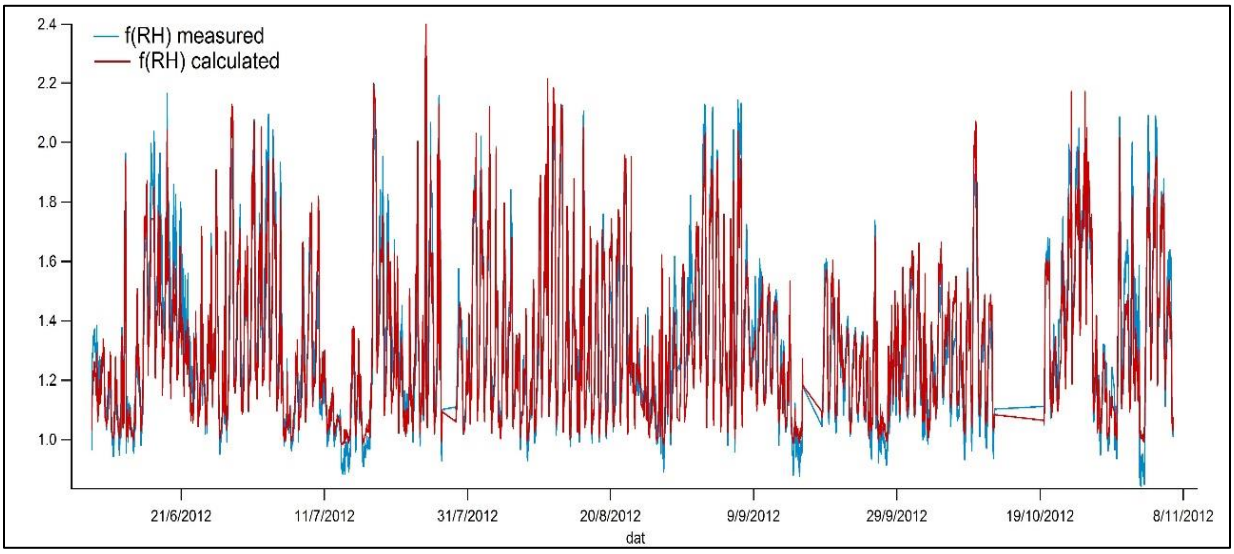
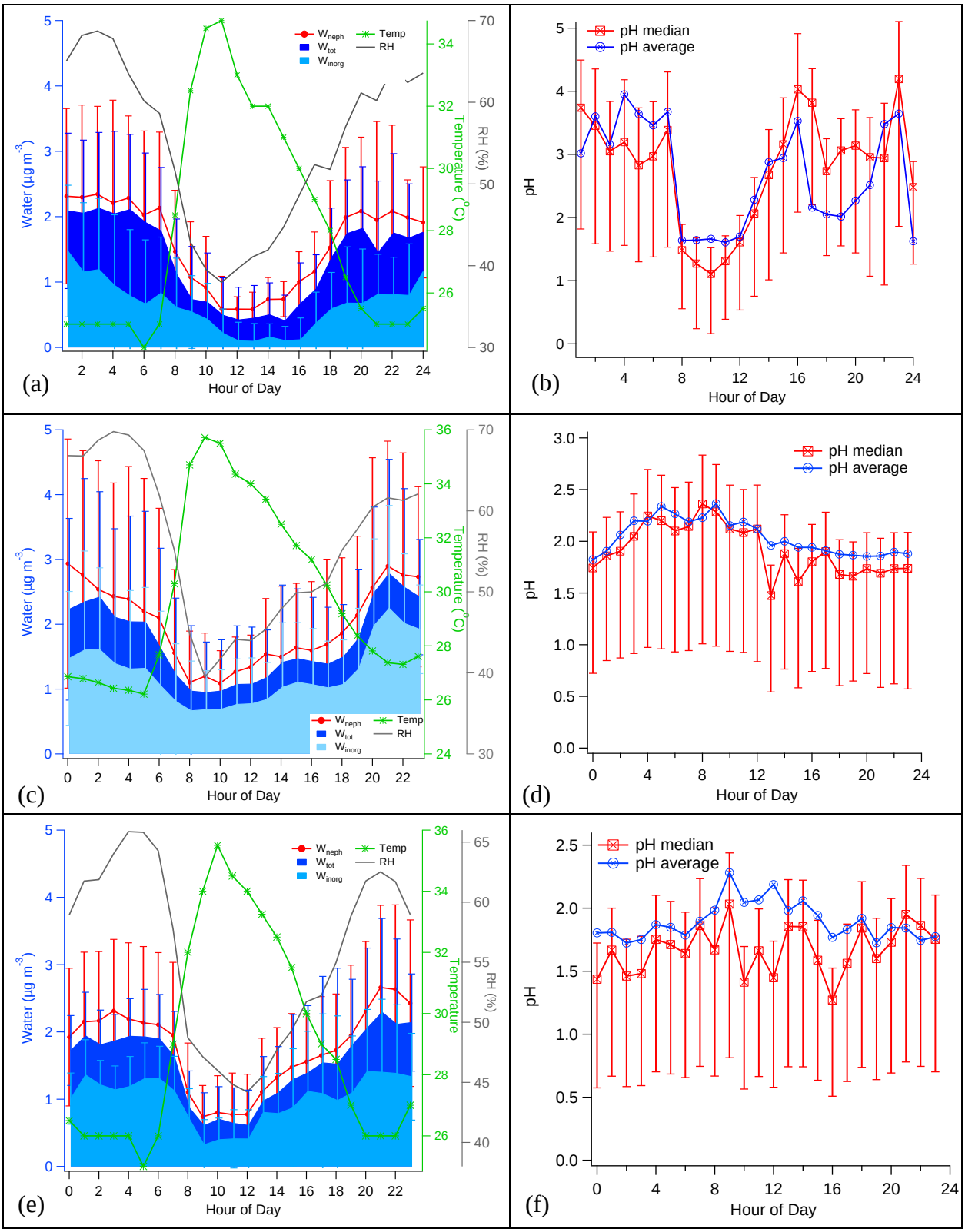


Figure S2: Time series of the measured (blue) and reconstructed (red) hygroscopic growth factors when using solely the dry scattering coefficients and the derived parameterization with the RH.

2. Diurnal variability of aerosol water and pH of different sources/ source regions

The diurnal variability of the different components of aerosol water and the calculated pH from the thermodynamic model ISORROPIA-II are calculated based on difference sources and source regions in order to see the influence of natural and anthropogenic emissions on both fine aerosol water and pH.

Figure S3 portrays the diurnal variability of the water components on the left and the diurnal variability of submicron pH on the right. Sources and source regions are the ones identified in Table 1 of the manuscript, namely biomass burning, Istanbul and countries around the Black Sea, Continental Europe, dust and marine origin.


(a)
Water (μg m-3)
Temperature (°C)
RH (%)
Hour of Day
Wneph
Wtot
Winorg
Temp
RH
(b)
pH
pH median
pH average
Hour of Day
(c)
Water (μg m-3)
Temperature (°C)
RH (%)
Hour of Day
Wneph
Wtot
Winorg
Temp
RH
(d)
pH
pH median
pH average
Hour of Day
(e)
Water (μg m-3)
Temperature
RH (%)
Hour of Day
Wneph
Wtot
Winorg
Temp
RH
(f)
pH
pH median
pH average
Hour of Day

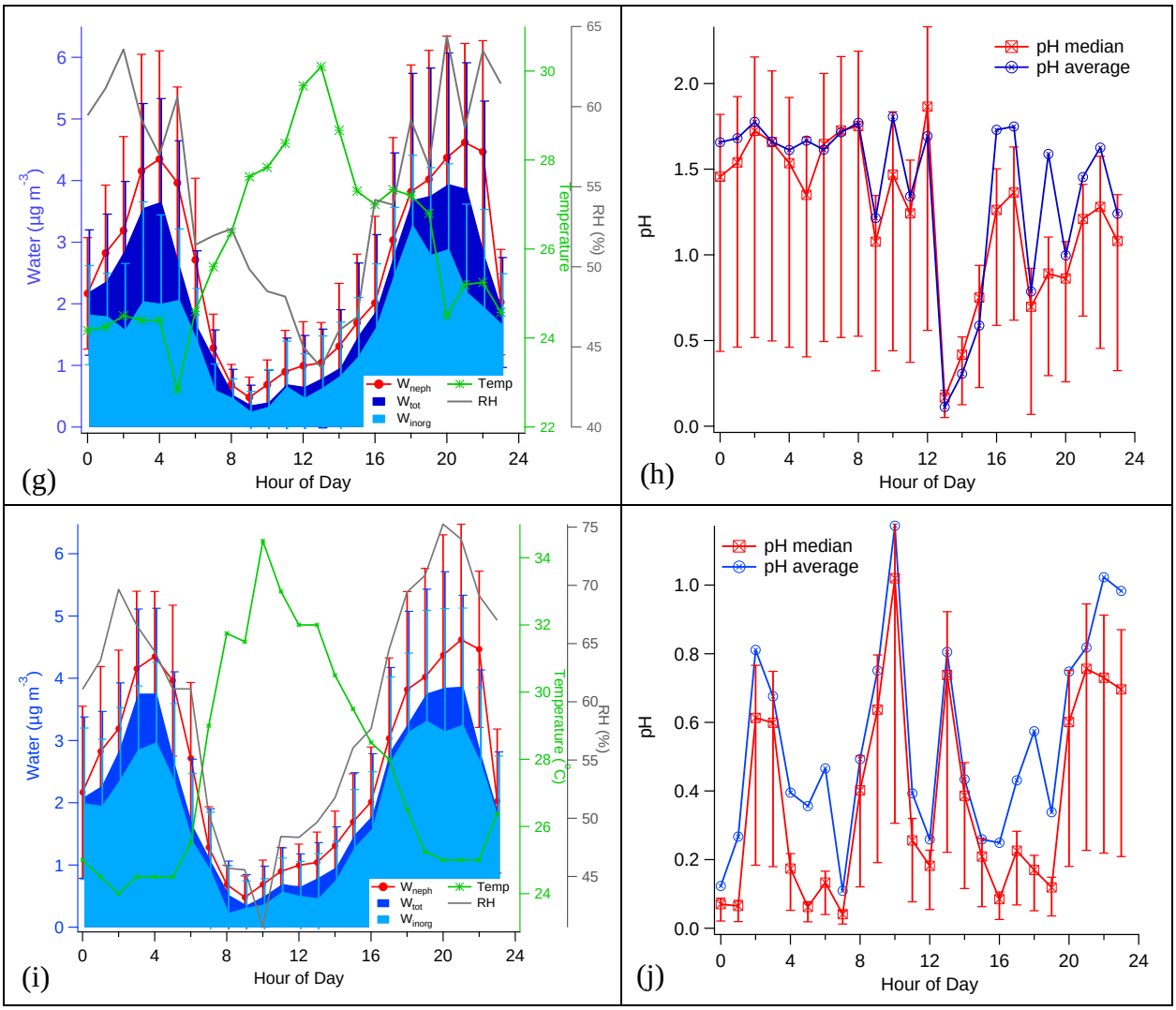


Figure S3: Diurnal variability of aerosol water (left panels) and pH (right panels) for the different sources/source regions: (a) and (b) for biomass burning, (c) and (d) for Istanbul and the Black Sea region, (e) and (f) for Continental Europe, (g) and (h) for mineral dust, and (i) and (j) for marine origin.