

Interactive comment on “Aerosol hygroscopicity at Ispra EMEP-GAW station” by M. Adam et al.

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The particle hygroscopic growth measurements were performed at 90% relative humidity (RH) according to the protocol recommended by EUSAAR (European Supersites for Atmospheric Aerosol Research), the EU-funded project in the frame of which these measurements were performed. The few humidograms we performed did obviously not cover all seasons and times of the day, and cannot be used to derive statistically significant values of the hygroscopic growth factor (GF) at various RH between 20 and 90%. However, we have shown in the response to Referee #1 that humidograms collected at our site in very different meteorological conditions can be well reproduced by the “gamma law” (Eq. 4) we used to derive the hygroscopic growth factor at any relative humidity GF(RH) from measurements performed at 90% RH (GF(90)).

We will consider revising the introduction and structuring of our manuscript according

C2605

to the advise of Referee #2, but concerning Figures 4 and 6, we do not see how we could show seasonal variations in the diurnal cycle of the GF(90) probability distribution functions as a function of the particle diameter in other way without using a third dimension or a movie.

There is no real city in the vicinity of the station closer than 20 km, but the population density in the surroundings is high (720 / km²), with many villages and roads. The mean aerosol density of 1.5 was estimated from the chemical composition of PM_{2.5} (see Fig. 1 in the response to reviewer 1), which at our site is dominated by particles in the 100 – 1000 nm range, as light scattering is.

The interpolation for missing months was performed on a diurnal cycle basis. For example, the monthly diurnal cycle for August was estimated based on the diurnal cycles from July and September. As we did not have the possibility to validate these results, we removed the data points obtained by interpolation (March 2009) from the data set used for further analysis. The figures showing the dependence of GF with RH (Fig. 10), the dependences of the enhancement factors with RH (Fig. 12) and the regressions between the enhancements factors and GF (Fig. 15), as well as the equations of the fittings were not significantly affected. The results obtained without considering the interpolated data points will be included in the revised version of the manuscript.

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