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

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We agree with the comment posted by S. Otto. Aerosol scattering, absorption, extinction and backscattering are indeed proportional to \(\frac{dN}{d\log D_p} \times \xi \times D_p \times dD_p\), with \(\xi\) as efficiency. Note that in the manuscript, \(N\) actually stands for \(\frac{dN}{d\log D_p}\). In order to avoid the confusion we will define \(n=\frac{dN}{d\log D_p}\) (as in “Atmospheric particles” edited by Harrison and van Grieken).

The extinction efficiency curve in Otto et al., ACP, 7, 4887-4903, 2007 (Fig. 16) is similar with ours, i.e. with a maximum around 600-700nm. For the particle number size distribution we selected, the corrected curves for aerosol scattering, absorption and extinction actually peak at about 300-400nm, as seen in the Figure 1 below (where \(n=\frac{dN}{d\log D_p}\)). This figure and associated comments do not affect in any way the calculations and the results we present in our manuscript.

We will modify the text on page 5300 as: “... the largest particle number concentration \((\frac{dN}{d\log D_p})\) is around 100 nm, the largest contribution to scattering \((\frac{dN}{d\log D_p} \times \xi \times D_p \times dD_p)\) is around 300-400 nm.”

The caption of Fig. 2 will be adjusted accordingly:

Figure 2. . . . particle number concentration \((n=\frac{dN}{d\log D_p})\) and the contributions to scattering, extinction, absorption and backscattering \((n \times \xi \times D_p \times \Delta D_p)\) for each diameter \((\lambda=550nm)\). \(n\) was recorded on 10th of February 2008, 05:00 UTC.

Caption of Fig. 1: Efficiency – \(\xi\) (for scattering – \(\sigma\), extinction – \(\kappa\), absorption – \(\alpha\) and backscattering – \(\beta\)), particle number concentration \((n=\frac{dN}{d\log D_p})\) and the contributions to scattering, extinction, absorption and backscattering \((n \times \xi \times D_p \times \Delta D_p)\) for each diameter \((\lambda=550nm)\). \(n\) was recorded on 10th of February 2008, 05:00 UTC.

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Fig. 1. See text.