We would like to express our sincere gratitude to Mr. John Ogren for reading our manuscript and for his useful comments. Also, we thank Mr. Ogren for his comments to the paper from Müller et al (Müller, T., Laborde, M., Kassel, G., and Wiedensolher, A.: Design and performance of a three-wavelenght LED-based total scatter and backscatter integrating nephelometer, Atmos. Meas. Tech., 4, 1291–1303, doi:10.5194/amt-4-1291-2011, 2011), recently published on AMT with the Angstrom-based correction scheme already provided by Anderson and Ogren (1998) for the TSI nephelometer.

Reply to the comments:

1) The MAAP measurements are not specific to carbon, nor do they tell you that the signal is due to a black substance. It is more appropriate to report the MAAP measurements as an absorption coefficient. The approach that the authors used to determine Equivalent Black Carbon (EBC) using an empirically-determined mass absorption efficiency from the MAAP and EC measurements is sound (although a discussion of the uncertainty of the EC measurement would be a useful addition to the paper). I recommend replacing the term "BC" with "EBC" throughout the paper, and abandoning the delusion that the MAAP measures "black carbon".

This point was also raised by the two Anonimous Referees and the term "black carbon concentration" (or *BC*) was replaced with "equivalent black carbon concentration" (or EBC) throughout the manuscript, Figure and Table.

Moreover, the following sentence has been added to explain how we determined the uncertainty of the measured EC concentration:

"The uncertainty for the measured EC concentration was calculated by adding one half of the minimum measured EC concentration to the 10% of the concentration (Err[EC] = min[EC]/2 + 0.1·[EC]). This formula gives higher uncertainty to low EC concentrations (Polissar et al., 1998)."

2) Please give the model number and lower size cut (D50) of the CPC used in the study.

Done. The following sentence has been added:

"(CPC, Model TSI 3772 with D50 of 10 nm.)".

3) I recommend using the lower-case "å" rather than the upper-case "Å" for the Ångström exponent, because "Å" is already used widely to represent a length of 10^-10 meter.

Done.

4) The comparison of the mass absorption efficiency with literature values should cite Bond & Bergstrom's (2005) review paper reporting 7.5 m2/g.

Done. The following sentence:

"Absorption cross sections between 8 m^2/g and 11 m^2/g are usually reported in literature (see for example Fernández-Camacho et al., 2010; He et al., 2009; Barnard et al., 2008; Arnott et al., 2003, 2005).",

was replaced with:

"Absorption cross sections between 7 m^2/g and 11 m^2/g are usually reported in literature (see for example Bond & Bergstrom's, 2005; Fernández-Camacho et al., 2010; He et al., 2009; Barnard et al., 2008; Arnott et al., 2003, 2005).".

The following reference was consequently added:

Bond, T. C. and Bergstrom, R. W.: Light absorption by carbonaceous particles: An investigative review, Aerosol Sci. Technol., 40(1), 27–67, doi:10.1080/02786820500421,521, 2005.

5) Delene and Ogren (2002) showed similar results for a number of the analyses in this paper, including the systematic dependence of aerosol intensive properties (singlescattering albedo, backscatter fraction) on scattering coefficient. They also showed how the Ångström exponent varied systematically with the submicrometer scattering fraction, similar to the PM2.5/PM10 fraction that Pandolfi et al evaluated. It would be useful to compare the results from MSY with the results from the four stations reported by Delene & Ogren.

The following sentences were added:

Section 3.1:
"Delene and Ogren (2002) measured values of the absorption, scattering and backscattering coefficients at 550 nm for PM_{10} on hourly base ranging between 0.38 Mm-1 and 4.62 Mm-1, 10.4 Mm-1 and 57.0 Mm-1, and 1.06 Mm-1 and 6.63 Mm-1, respectively at four regional measurement stations (EEUU, Canada and Alaska).";

Section 3.3:
"Similar relationships among aerosol optical properties were investigated by Delene and Ogren (2002).";

"However, the relative proportion of scattered and backscattered light (Figure 7c) was not constant being a function of the amount of scattered light. Thus, as the σ_{sp} values increased the B/S values were decreased indicating that the total

scattering of aerosols increased faster than the backscatter. Delene and Ogren (2002) also observed this systematic decrease of B/S with increasing σ_{sp}. This observed behaviour was likely due to the increasing importance of the forward scattering ($\theta \sim 0^{o}$) compared to backscattering ($\theta \sim 180^{o}$) when σ_{sp} increased. Furthermore, the decrease in the å exponent observed as σ_{sp} drops below 35 Mm^{-1} (Figure 7e) suggests that during low aerosol concentration the MSY measurement site has more relatively larger particles present. This dependence of å with σ_{sp} was also observed by Delene and Ogren (2002) at two continental stations."

6) There is a large body of work on aerosol mass scattering efficiency, and the paper should include citations and comparisons with the previous work.

The following sentence was added to the Section 3.2:

"Values of fine mass scattering cross sections at 550 nm of 3.8 m2/g, 3.4 m2/g, and 4.9 m2/g were recently measured in Mexico City (Paredes-Miranda et al., 2005), Beijing (Bergin et al., 2001), and India (Mayol-Bracero et al., 2002), respectively.",

7) Previous studies (e.g., Delene and Ogren, 2002) have used B/S ratio, and this is the first time I"ve seen an analysis using S/B. Given that B can be quite small, it makes more sense to put it in the numerator to avoid dividing by a small (and noisy) number. It also makes more sense because climate forcing calculations use the upscatter fraction or asymmetry parameter, which can be derived from the backscatter fraction.

We agree. S/B was replaced with B/S in the manuscript, Table and Figures.