Dear Hans,

Thank you very much for your detailed review of our manuscript. We gratefully acknowledge your suggestions and respond point-by-point. The changes can be tracked in the annotated manuscript enclosed to this response. Line numbers refer to the annotated manuscript.

GENERAL REMARKS
Responding to the comment by Grisa Močnik we added a paragraph on the first appearance of the term “black carbon” to the section on historic definitions (se lines 364 – 374).

Responding to the comment by Olga Popovicheva, we changed the criterion of the specific surface area in Table 1 from “typically greater than 10m^2 g^{-1}” to “typically larger than 10 m^2 g^{-1} and may exceed 100 m^2 g^{-1}”.

Responding to the comment by Shuka Schwarz, we added a separate recommendation for mixed particles on line 552, reading “Mixed particles containing a BC fraction should be termed BC-containing particle instead of BC particle or soot particle”.

SPECIFIC REPLIES
1. The title referring to “interpretation of black carbon measurements” does not connect well to the content of the manuscript. I would suggest something along the lines of “Recommendations for black carbon-related terminology.
Reply: We agree and changed the title to “Recommendations for reporting "black carbon" measurements”

2. P 9488, L 24: I suggest replacing “thermal methods” with “thermal-optical methods” here and elsewhere in the manuscript. Virtually all of these methods use an optical reflection or transmission correction for pyrolized carbon as stated in Table 2 (P 9517) of the manuscript.
Reply: Accepted and done.

3. P 9489, L 26: Replace “formed in incomplete combustion” with “formed in incomplete combustion of carbonaceous material”.
Reply: Accepted and done.

4. P 9490, L 26: Table 1 (P 9516):
a) Morphology: Mention fractal-like chain aggregates and the change of fractal dimension (fractal collapse, fractal dimension changes from 1.8 to _3) during aging in the atmosphere.
Reply: Agreed; the Table 1 entry for morphology reads now: “Fractal-like chain aggregates consisting of small carbon spherules of < 10 to approx. 50 nm in diameter; fractal dimension ranges from $\leq$ 2.0 for fresh combustion particles to $\cong$ 3.0 for aged aerosol; specific surface area typically larger than 10 m^2 $g^{-1}$and may exceed 100 m^2 g^{-1}.

b) Solubility: Nice list of solvents, but isn’t it true that BC is insoluble in any solvent as stated on P 9500, L 22-23?
Reply: Agreed; the Table 1 entry for solubility reads now: “insoluble in any solvent including water”.

5. P 9491 L 19: In most thermal-optical methods evolved CO2 is quantified as CH4 through FID.
Reply: Agreed; on line 170 ff we modified the sentence to: “The carbon contained in the analyzed aerosol sample is detected as CO_2 by non-dispersive infrared absorption or other CO_2 specific detection methods or as CH_4 by a flame-ionization detector”.

6. P 9492, L 5-10: Mention that the pyrolysis correction is done through optical methods and depends strongly on the method used (i.e., TOR vs. TOT and temperature protocol).
Reply: Agreed; on line 198 ff we added "Pyrolysis correction is performed by measuring filter transmission or reflectance during the thermal-optical analysis step. Yet the correction differs significantly between transmission measurement (TOT, thermal-optical transmission) or reflectance measurement (TOR, thermal-optical reflectance) and temperature protocol (Schmid et al., 2001)".

7. P 9492, L 5-10: Another commonly used term that should be defined for completeness is "pyrolized carbon".
Reply: Agreed; on line 194 ff we added "The EC fraction formed by OC conversion during pyrolysis is defined as pyrolyzed carbon (Boparai et al., 2008)".

8. P 9492, L 18-20: The "extinction minus scattering method" is not limited to the laboratory but certainly to elevated concentrations as found in atmospheric plumes. The UW extinction cell has been used for BC measurements in combination with a nephelometer during airborne deployment, characterizing smoke in oil fire plumes (Weiss and Hobbs 1992).
Reply: Agreed; starting on 205 the section on photoacoustic spectroscopy and other methods reads now "However, photoacoustic spectroscopy is a candidate reference method for atmospheric observations and analytical applications (e.g., Petzold and Niessner, 1996; Arnott et al., 1999; Arnott et al., 2003; Lack et al., 2006), while the measurement of light extinction minus light scattering may offer another possibility in the laboratory (Schnaiter et al., 2005b; Sheridan et al., 2005) or in atmospheric plumes with very high aerosol mass concentrations (Weiss and Hobbs, 1992)".

9. P 9433, L 27: Include the upper wavelength of the red spectral region (i.e., 700 nm).
Reply: Agreed; on line 252 we added "($600\ \text{nm} < \lambda \leq 700\ \text{nm}$)".

10. P 9494, L 15: I strongly suggest replacing "laser incandescence" with" laserinduced incandescence", here and elsewhere in the manuscript. It is not the laser that is incandescing.
Reply: Accepted; changes were made throughout the manuscript.

11. P 9495, L 22: Briefly explain what limits the use of Raman spectroscopy for quantitative measurements.
Reply: From line 306 ff the paragraph on the limitations of Raman spectroscopy reads now: "Whereas this method has its strengths in identifying characteristics of the carbon structure, its applicability for a quantitative measurement of carbon mass is limited for today's technology. Limitations are mainly related to variations in the parameters of the Raman spectra, i.e., band widths and band intensities, for different types of carbonaceous reference materials and the carbonaceous fraction of the atmospheric aerosol. Yet, the method of Raman mapping (Ivleva et al., 2007) offers a promising approach towards a quantitative application of Raman spectroscopy for carbon mass concentration measurement."

12. P 9497, L 1-2: These limitations of electron microscopy are greatly reduced by computer-controlled electron microscopy, enabling us to automatically characterize the morphology of thousands of particles deposited on a filter. On the opposite, tomography is very labor intensive and limited to individual particles.
Reply: Agreed; on line 346 we added the sentence "However, these limitations are reduced to a large extent by recent computer-controlled image processing approaches, enabling the automatically characterization of the morphology of thousands of particles deposited on a filter".

13. P 9498, L 9: "60% carbon" Please specify if this is a mass or mole percentage.
Reply: On line 391 ff the sentence reads now "It contains over 60% carbon [by mass] with the major accessory elements hydrogen, oxygen, nitrogen, and sulfur" (Goldberg, 1985)".

14. P 9501, L 1-2: “almost uniform absorption of light over the entire visible spectrum”. This doesn’t seem to be all that uniform! If we use the range of BC absorption Angstrom exponents given in this manuscript (i.e., 1.0 – 1.5) and a visible range from 400 to 700 nm, we get a change in absorption coefficient ranging from a factor of 1.75 to 2.3 between 700 and 400 nm.
Reply: Agreed; we replaced “almost uniform absorption of light over the entire visible spectrum” by “efficient absorption of light over the entire visible spectrum”.