

Review of manuscript acp-2010-481

Title: Inferring absorbing organic carbon content from AERONET data

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General Comment:

This is a very interesting paper. The authors have built on previous work to produce what appear to be reasonable estimates of organic carbon content. The methodological approach is sound and clearly explained in the manuscript. The paper is well written and should be published after addressing a few details listed below.

-It is suggested that the authors abstain from using the term 'global' in the context of this analysis. Even if all operating AERONET stations at a given time are used, its coverage is by no means global. The oceans are not covered at all and large land-masses: Northern South America, the most of the SH African Continent, most of Asia, and Australia are not covered. Thus referring to AERONET's limited coverage of mainly Eastern US and Western Europe as 'global' is quite a stretch.

-Why do the authors use different notation on pages 18369 and 18370 for the imaginary refractive index ( $m$  and  $k$ )?

- Page 18371, 10 measurements per month over how many days per month? Under cloud free conditions 10 measurements could be done in as little as two days.

- How many years of data were used? The length of the record is different for different stations. Some sites like Alta Floresta and GSFC have nearly ten years of data, whereas some sites have just been operated over a few months, generally during field campaigns. The authors should document the uncertainty of the reported results based on the volume of data (which is site dependent) and the assumptions used in the analysis. The statistical uncertainty of the results is not the same at all the sites. How has this been factored-in in the analysis? Error or uncertainty bars should be provided.