

Supplementary material to

Correction for a measurement artifact of the Multi-Angle Absorption Photometer (MAAP) at high black carbon mass concentration levels

A.-P. Hyvärinen*¹, V. Vakkari², L. Laakso^{1,3}, R.K. Hooda^{1,4}, V.P. Sharma⁴, T.S. Panwar^{4,5}, J.P. Beukes³, P.G. van Zyl³, M. Josipovic³, R. M. Garland^{6,7}, M. O. Andreae⁶, U. Pöschl⁶, and A. Petzold⁸

¹ Finnish Meteorological Institute, P.O. Box 503, FIN-00101, Helsinki, Finland

² Department of Physics, University of Helsinki, P.O. BOX 64, 00014 University of Helsinki, Finland

³ School of Physical and Chemical Sciences, North-West University, Potchefstroom, South Africa

⁴ The Energy and Resources Institute (TERI), Darbari Seth Block, IHC Complex, Lodhi Road, New Delhi 110 003, India

⁵ WWF India, Lodhi Road, New Delhi 110 003, India

⁶ Max Planck Institute for Chemistry, P.O. Box 3060, 55020 Mainz, Germany

⁷ Natural Resources and the Environment, The Council for Scientific and Industrial Research (CSIR), Pretoria, South Africa

⁸ Forschungszentrum Jülich GmbH, Institute of Energy and Climate Research IEK-8: Troposphere, 52425 Jülich, Germany

* To whom correspondence should be sent: antti.hyvarinen@fmi.fi

Supplementary results

Each laboratory artifact case (see Fig 3a in the manuscript for an example) was fitted with equation (9) in the manuscript (Chapter 3.3), which led to a collection of parameters $BC_{max} \times Q$, k , n and m_d . These parameters were fitted with suitable equations as a function of $BC_{ini} \times Q$. The laboratory results, together with the fitted curves, are plotted in figures S1-S4.

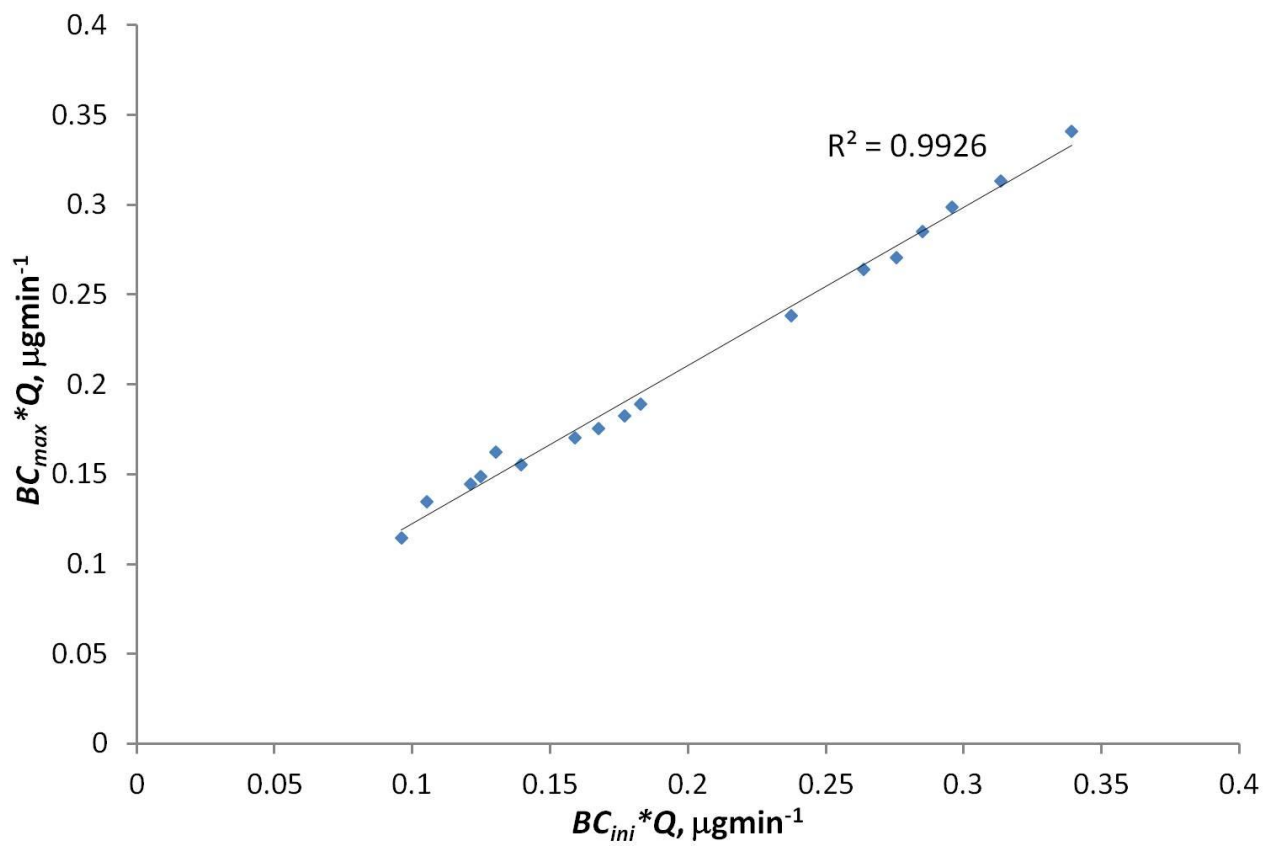


Figure S1. $BC_{max} \times Q$ as a function of $BC_{ini} \times Q$ for equation (9) in the manuscript. The fitted curve is $BC_{max} \times Q = 0.8792 \times (BC_{ini} \times Q) + 0.0347$

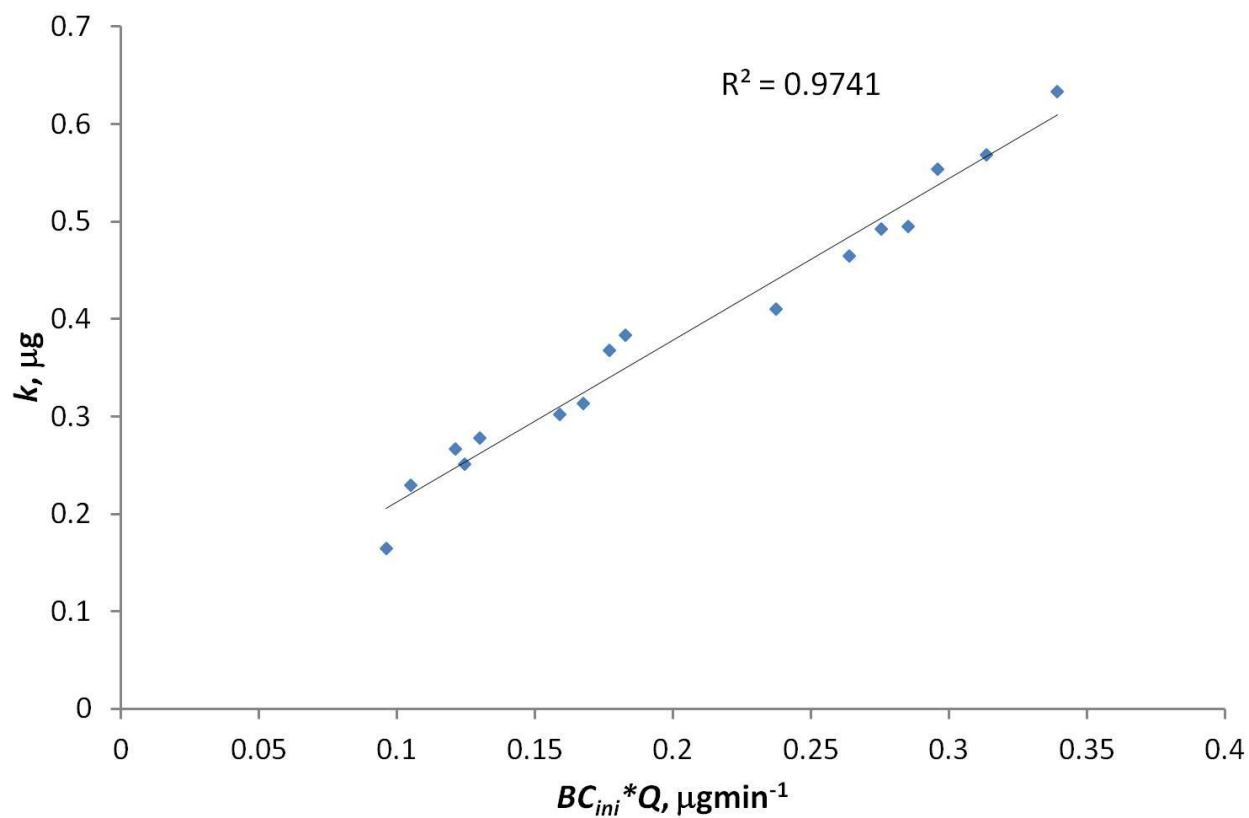


Figure S2. k as a function of $BC_{ini} \times Q$ for equation (9) in the manuscript. The fitted curve is $k = 1.6623 \times (BC_{ini} \times Q) + 0.0462$

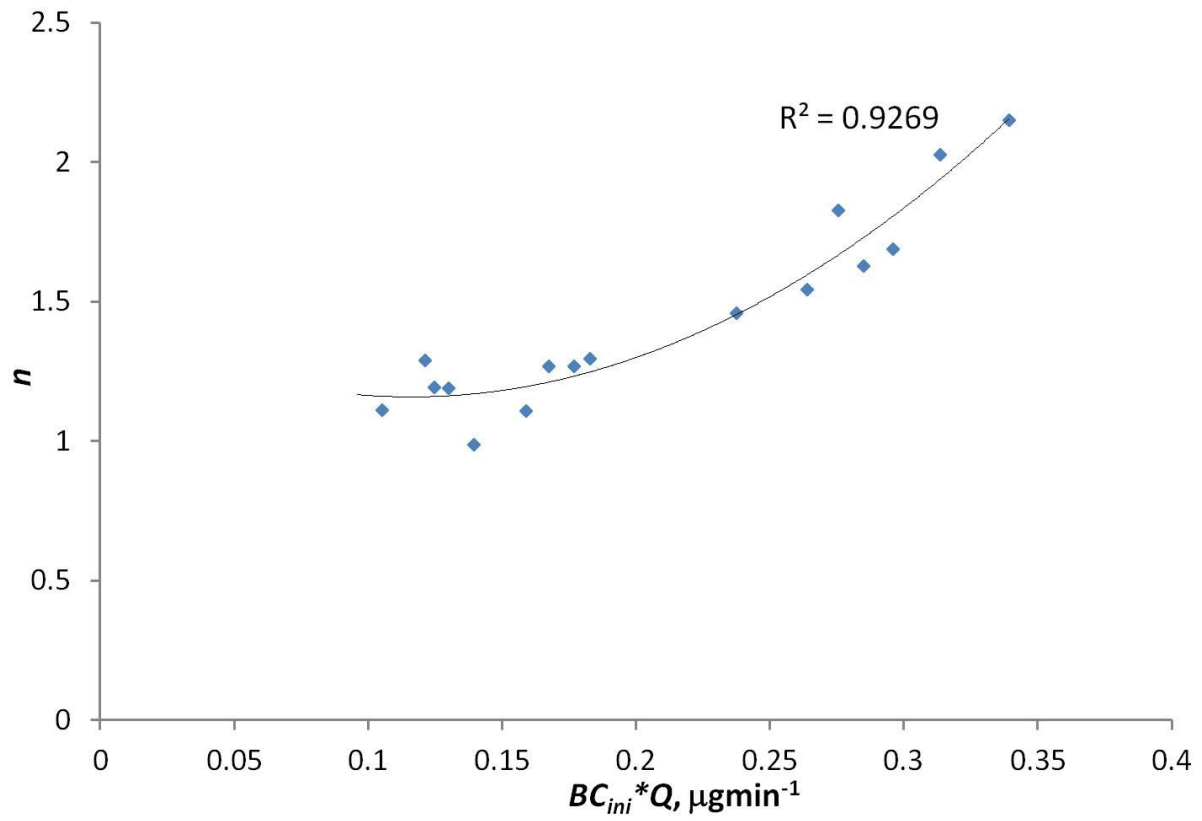


Figure S3. n as a function of $BC_{ini} \times Q$ for equation (9) in the manuscript. The fitted curve is $n = 20.02 \times (BC_{ini} \times Q)^2 - 4.6454 \times (BC_{ini} \times Q) + 1.428$

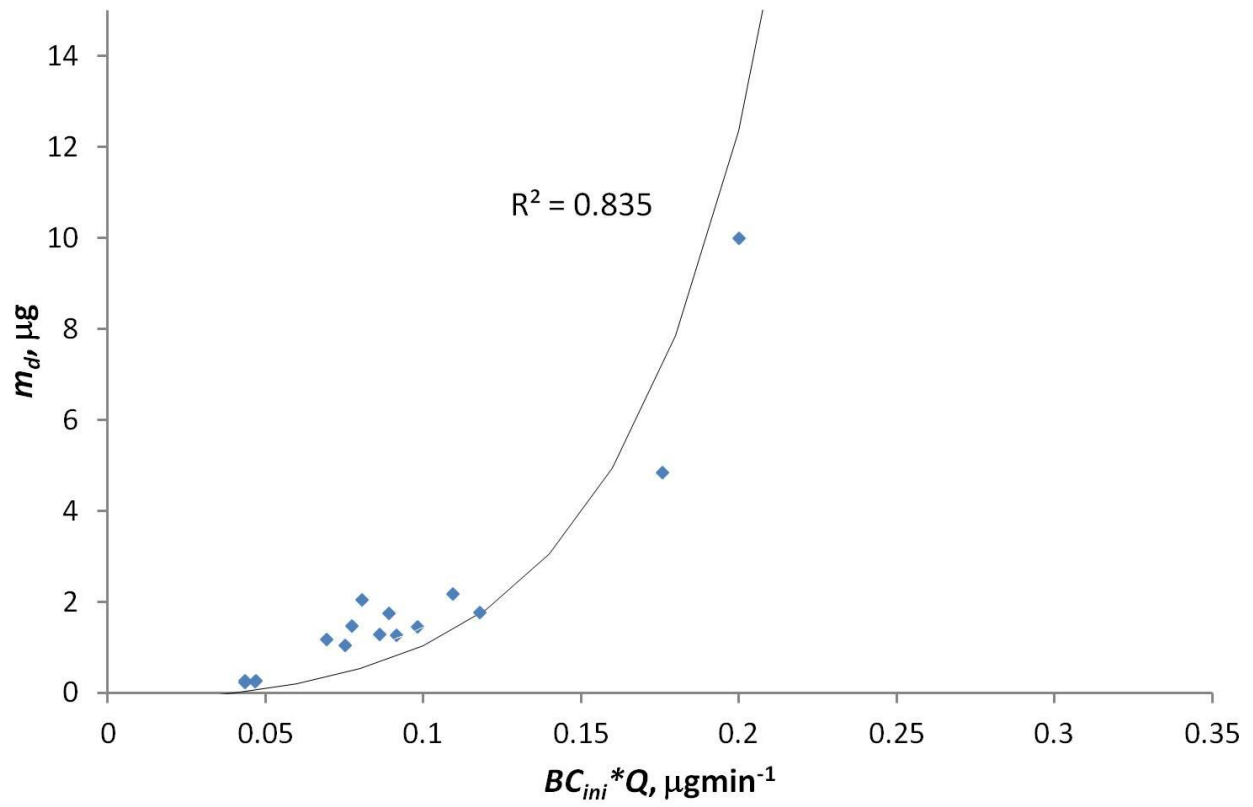


Figure S4. m_d as a function of $BC_{ini} \times Q$ for equation (10) in the manuscript. The fitted curve is $m_d = 0.1632 \times \exp(21.798 \times (BC_{ini} \times Q)) - 0.4$