

## ***Interactive comment on “Comparison between CARIBIC aerosol samples analysed by accelerator-based methods and optical particle counter measurements” by B. G. Martinsson et al.***

### **Anonymous Referee #3**

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I agree with referee 1 that the CARIBIC is a very important research program for studying the atmospheric composition in large geographical areas and that the impactor method analyzed here is useful for measuring the chemical composition of aerosols. The article is clear and the number of analyzed samples sufficiently high; however there are some points which must be clarified before it can be published. 1) The bouncing of particles outside the impaction zone is a key point in the article. The use of special greases on the impactor substrates before sampling can prevent bouncing which can introduce a serious bias on the presented data. The authors should discuss this point (some of the observed problems could be due to this) and justify why they did not use such a

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method. 2) One PIXE and PESA spectra inside 5.5 mm and outside could be useful together with more details on the experimental conditions (beam current, measuring time..). 3) Why Si is not detected? There many articles (see articles by the Louvre group or by Willy Maenhaut) showing that PIXE can detect down to Na 4) The ratio of the mass deposited inside 5.5 mm and between 5.5 and 9.5 may be determined only for elements with a strong signal, but the deposition pattern does depend on the typical element size-distribution; therefore S particles (mainly in the fine fraction) and Ca particles (mainly in the coarse one) may have a different deposition pattern 5) Carbonaceous aerosol determined by PIXE can be smaller than that obtained by OPC. Is it possible to give an estimate of the effect? 6) Par. 2.2: The uncertainty on  $C_v$  is 50% and there strong assumptions on particle composition: how reliable may the comparison?

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Interactive comment on Atmos. Meas. Tech. Discuss., 7, 3253, 2014.

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