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# Air pollution studies in terms of PM2.5, PM2.5-10, PM10, lead and black carbon in urban areas of Antananarivo - Madagascar

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(Submitted on 5 Apr 2012)

Atmospheric aerosols or particulate matters are chemically complex and dynamic mixtures of solid and liquid particles. Sources of particulate matters include both natural and anthropogenic processes. The present work consists in determining the concentrations of existing elements in the aerosols collected in Andravoahangy and in Ambodin'Isotry in Antananarivo city (Madagascar). The size distribution of these elements and their main sources are also studied. The Total Reflection X-Ray Fluorescence spectrometer is used for the qualitative and quantitative analyses. The results show that the concentrations of the airborne particulate matters PM2.5-10 are higher than those of PM2.5. The identified elements in the aerosol samples are Ti, Cr, Mn, Fe, Ni, Cu, Zn, Br, Sr and Pb. The average concentrations of these elements are also higher in the coarse particles than in the fine particles. The calculation of the enrichment factors by Mason's model shows that Cr, Ni, Cu, Zn, Br and Pb are of anthropogenic origins. The average concentrations of lead (2.8 ng.m<sup>-3</sup>, 31.3 ng.m<sup>-3</sup> and 19.6 ng.m<sup>-3</sup> respectively in aerosols collected in Andravoahangy in 2007 and in 2008 and in Ambodin'Isotry in 2008) are largely lower than the average concentration of 1.8  $\mu$ g.m<sup>-3</sup> obtained in 2000 in the Antananarivo urban areas. The concentration of black carbon is higher in the fine particles. The Air Quality Index category is variable in the two sites.

Comments: 6 pages, 2 figures

Subjects: **Atmospheric and Oceanic Physics (physics.ao-ph)**

Cite as: **arXiv:1204.1498v1** [physics.ao-ph]

## Submission history

From: Raelina Andriambololona [view email]  
[v1] Thu, 5 Apr 2012 13:36:51 GMT (129kb)

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