**Major, trace and Rare Earth (REEs) elements in aerosol samples collected at Ny-Ålesund (Svalbard Islands) during the 2010 sampling campaign.**

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Aerosols and their interactions with clouds and snow surface can have a significant impact on the radiative balance in the Arctic. This holds true especially for the spring season when the Arctic environment is climatologically very sensitive and intrusion of air masses with a high aerosol load from northern continental regions is favoured. In particular, the atmospheric transport from the highly industrialized areas at mid latitudes of the Northern Hemisphere represents a major delivery pathway of trace metals as well as ionic species to the remote Arctic environment. In order to achieve a better knowledge of the timing and impact of such processes, a continuous aerosol sampling during spring and summer seasons was carried out at Ny-Ålesund (Svalbard Islands) using PM10 low-volume (24 h resolution) and medium-volume (96 h resolution) samplers with Teflon filters. The samples chemical characterization was carried out by Ion Chromatography (IC) and Inductively Coupled Plasma – Sector Field Mass Spectrometry (ICP-SFMS). Here, preliminary results on the metal aerosol content are reported. In order to improve the sensitivity of the ICP-SFMS technique for the daily PM10 samples, an APEX desolvatation system, equipped with an ACM module able to reduce the oxide interferences, has been employed as a sample introduction system. Such a set-up has made possible the quantification of trace metals at sub-ppb levels. Na, K, Ca, Al, Zn and Fe were the metals showing the highest concentrations (at ng/m3 level), while the other elements were present at few pg/m3 levels. The enrichment factors, calculated considering Al as crustal reference, are higher than 100 for Zn, Mo, As, Cd, Hg, Pb, pointing out their dominant anthropic origin. The chemometric investigation on the experimental results shows an evident separation between spring and summer arctic PM10 samples. Principal Component Analysis evidences a strong correlation among Al, Mn, Ti and Fe, as expected for metals mainly coming from crustal sources (both from local inputs and long-range transport). A correlation among As, Cu, Hg, K, Na and Pb is evident. As, Cu, Hg and Pb could be attributed to long range transport of pollutants from anthropized areas in North America and North Europe. Another PCA factor includes Cr, Ni and V. This factor could be related to emissions from fossil fuel, coal and heavy oil combustion processes. REEs fingerprint (including the so-called Europium anomaly) was used in differentiating local from long-range transport sources (mainly from North Europe in spring).

Proposed topic: Implementation of Ny-Ålesund monitoring activities

Presentation preference: Oral