Report on AMS and lidar datasets submitted

Participation to EMEP international campaign (January-February 2013)

During 11 January - 8 February 2013 was carried out ACTRIS - EMEP campaign, an international intensive measurements campaign which had the object to study aerosols and their oxidation capacities, both at ground level and altitude. INOE was involved in the campaign as an active remote sensing ACTRIS station. Were used both multichannel Raman lidar system (RALI) and aerosol mass spectrometer (C-ToF AMS).

A. **Variation of the chemical composition of submicron aerosol in the summer time**

During the summer, total average concentration of the 5 main fractions analyzed of non-refractory submicron aerosol was 2.8 μg/m^3. Aerosols were compounds in almost 50% from organic fractions, 25% sulphates and 15% ammonium, with low amounts of nitrate and chloride. The most important sources of aerosols in the summer time are agriculture and road traffic, but also long range reansported aerosols like biomass burning.

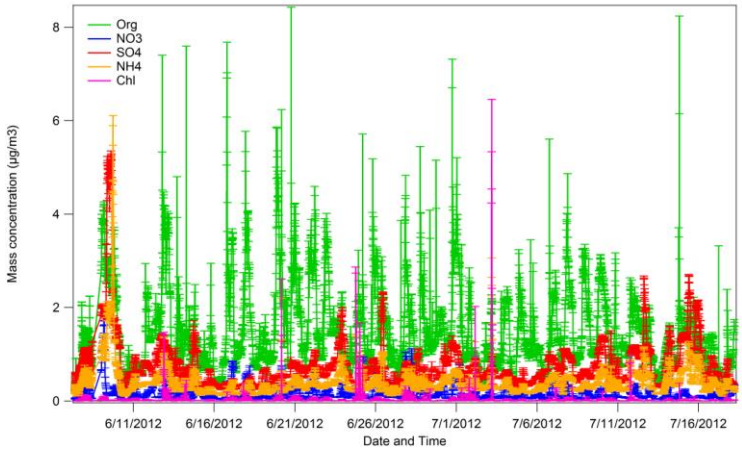

Fig. 1 Time series of mass concentrations and temporal variation of submicron non refractory aerosol chemical composition

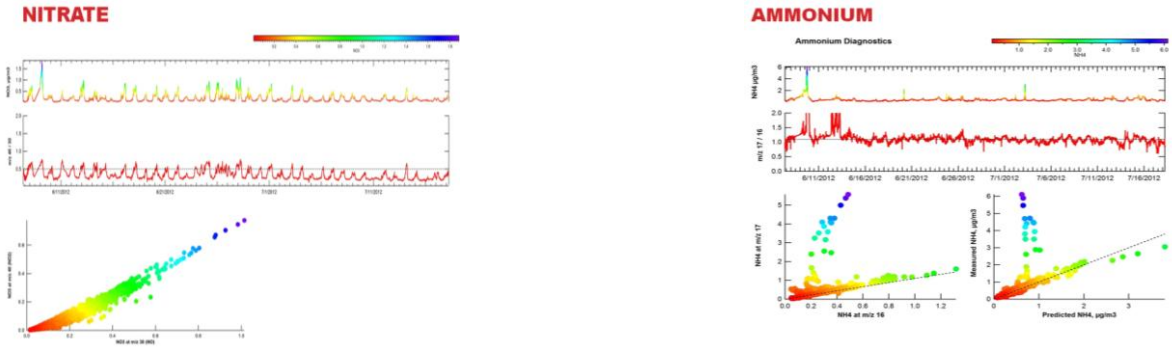

Fig. 2 Analysis of AMS system stability during EMEP campaign

B. **Variation of the chemical composition of submicron aerosol in the winter time**

In the winter were found increased proportion of the organic fraction about 49% and a constant distribution for sulfate (15%), ammonia (14%) and nitrate (19%) . There were observed episodes that indicate increased concentrations of submicron aerosol, mainly due to burning fossil fuels for domestic heating.

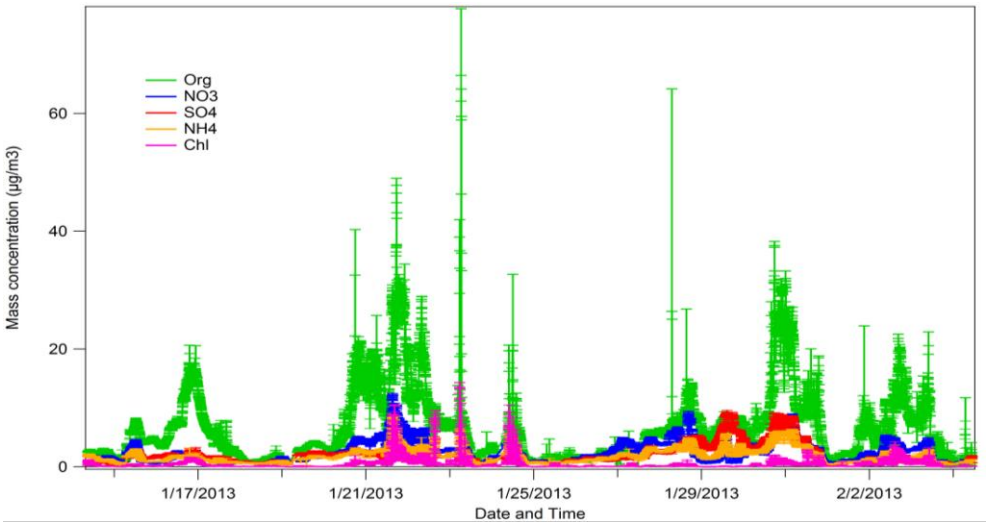

Fig. 3 Time series of mass concentration concentrations and temporal variation of submicron non refractory aerosol chemical composition

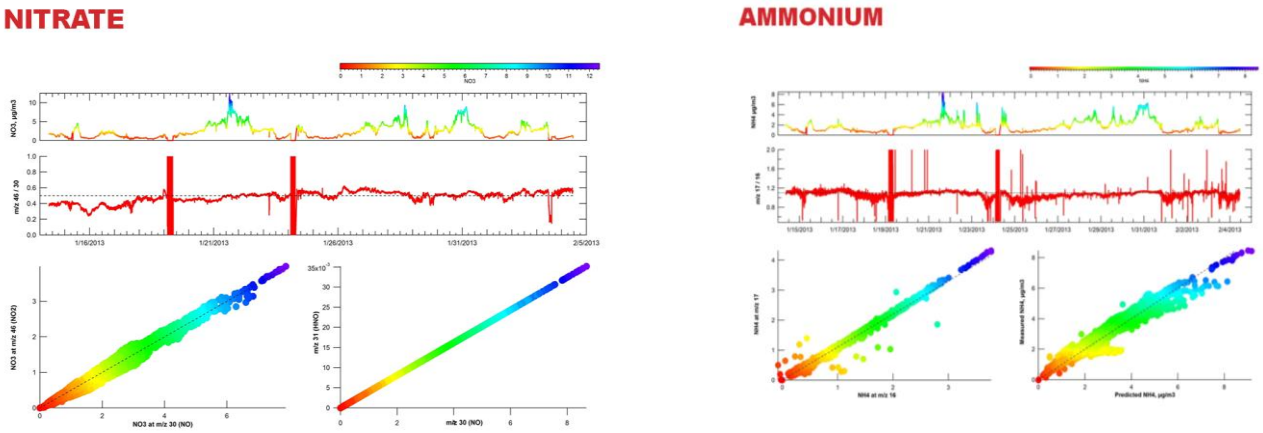

Fig. 4 Analysis of AMS system stability during EMEP campaign

Ground calibration campaign of Calipso satellite - CAL-VAL EARLINET campaign

INOE, member of the international network EARLINET was part of CAL-VAL campaign of CALIPSO satellite. For this, lidar measurements were performed on the ground every time the satellite passes over location at a distance of 100km.

The measurement data are processed and submitted to EBAS database, which is the common database within ACTRIS network. These measurements are used to compare ground measurements with LIDAR products from CALIPSO satellite.

In order to achieve the objectives there were performed lidar measurements having as result vertical profiles of aerosol optical properties. Ground lidar measurements were carried out in series of 2 hours each, centered on the interval when the satellite measured at a distance less than 100km.

During 1.01.2012-1.11.2013 were 103 cases when the satellite pass. EARLINET network implemented a procedure whereby warnings about exact times and distances between the location and the satellite are sent weekly.

Participation in the international campaign axis Romania - Greece September 2012

The aim of this campaign was the evaluation of air quality and study of transport processes along the axis Aegean Athens (Greece) and Bucharest (Romania) using LIDAR techniques

An intensive synchronized session measurements from three Lidar stations (Athens Lat: 37.96N, Lon: 23.78, Student: 220m, Evia-Oxylithos Lat: 38.57N, Lon: 24.13, Elev: 110m and Bucharest Lat: 44.348N, Lon : 26.029E, Student: 93m) was conducted in the period 15 - 29 September 2012 and had the aim to investigate the vertical distribution of the aerosol, vertical distribution of opto-chemical properties and climatology over the three locations. In this session attended two stations that are part of the Romanian Lidar Network - ROLINET (LIDAR ROmanian NETwork) Timisoara (Lat: 45.733N. Lon: 21.216, Elev: 102m) and Iasi (Lat: 47.166N. Lon : 27.566, Elev 200m).
Time series of range corrected signal (RCS) are available at the following web address: ***http://quicklooks.inoe.ro*** (Romania). These images describe the temporal evolution of the atmospheric structure and are usually are used to estimate altitudes of aerosol layers.

Raman Lidar measurements statistics for 2012-2013

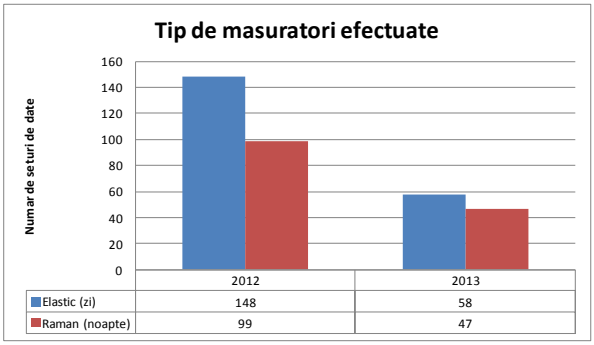

Fig. 1 Measurement types

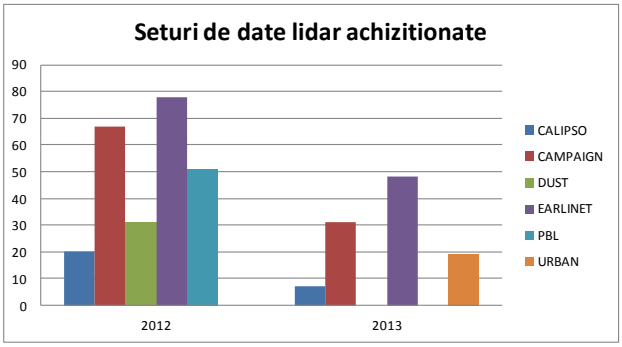

Fig. 2 Datasets acquired with Raman Lidar

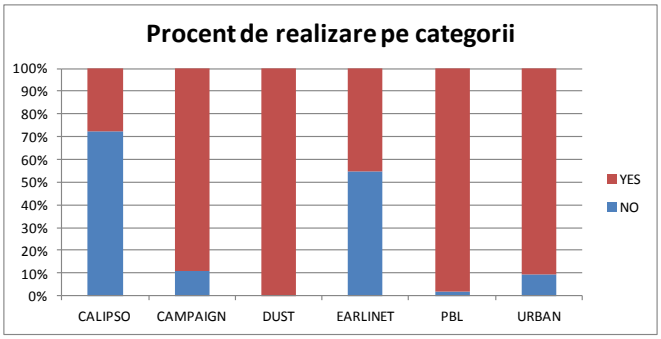

Fig. 3 Categories of measurements and percentages of achievement

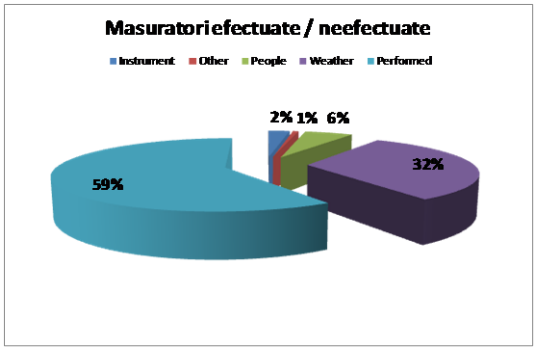

Fig. 4 Measurements percentage achieved/not achieved and the reasons