**Institute of Atmospheric physics, National Central University**

**Master Seminar**

Time: 2017/09/22 Location: S1-713

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**Contrasted spatial and long-term trends in precipitation chemistry and deposition fluxes at rural stations in France**

**Abstract**

Precipitation as a powerful mechanism to remove pollutions from the atmosphere. The main purpost of study focus on: Set up a database atmospheric deposition. Determine inorganic component concentrations, fluxes. Investigate the spatial pattern. Evaluate the seasonal evolution, long-term trends. Precipitation data was collected in 1995-2007 at 37 sampling sites of three monitoring networks in France. Method was use include: volumetric mean, deposition flux, trends analysis. With regard to spatial variations, the mean annual pH in particular ranged from 4.9 in the north-east to 5.8 in the south-east. This gradient was related to the concentration of NO3- and non-sea-salt SO42- and of acid-neutralising compounds such as non-sea-salt Ca2+ and NH4+. In terms of seasonal variations, winter and autumn pH were linked to lower acidity neutralisation than during the warm season. The temporal trends in atmospheric deposition varied depending on the chemical species and site location. The most significant and widespread trend was the decrease in non-sea-salt SO42- concentrations (significant at 65% of the stations). At the same time, many stations showed an increasing trend in annual pH. Reduction in SO2 emissions that has been imposed in Europe since the 1980s is the major reason. Temporal trends in inorganic N concentrations were rather moderate and not consistent with the trends reported in emission estimates. Despite the reduction in NOx emissions, NO3- concentrations in atmospheric deposition remained mostly unchanged or even increased at three stations. In contrast NH4+ concentrations in atmospheric deposition decreased at several stations located in western and northern areas, while the estimates of NH3 emissions remained fairly stable. The decrease in non-sea-salt SO42- and NH4+ concentrations was mainly due to a decrease in summer values and can in part be related to a dilution process since the precipitation amount showed an increasing trend during the summer.

**Main reference:**

A. Pascaud,S. Sauvage, P. Coddeville, M. Nicolas, L. Croise, A. Mezdour , A. Probst, 2016. Contrasted spatial and long-term trends in precipitation chemistry and deposition fluxes at rural stations in France. Atmospheric Environment 146 (2016) 28e43