Trace element distribution in size separated aerosols from Ny Alesund during the ASTAR 2000 campaign

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INTRODUCTION
The influence on climate, ecosystems and human health by atmospheric particles is undoubted but measurements to quantify the emissions from natural and anthropogenic sources as well as the transport and deposition behaviour in polar regions are still incomplete. To study these processes in combination with remote sensing techniques like LIDAR, Stelphotometer and Nephelometer, it is necessary to analyse different properties of aerosol particles like size distribution, chemical composition, isotopic ratios etc. because each data enter into global modelling.

During the ASTAR campaign in March/April 2000 ground based aerosol sampling was performed by two different sampling systems, which were installed on top of the roof at the Japanese station Rannbogen 8 m above ground level.

We will present results from trace element analyses carried out by solution ICP-MS and ETV-ICP-MS. In addition data from electron microscopy measurements will be presented to have information about morphology and composition of the aerosol particles.

EXPERIMENTAL
Size distribution and time series for some typical tracer elements (Al, Fe as tracers for mineral dust, Na, Mg as tracers for sea salt and Pb as tracers for anthropogenic sources) are exemplarily shown.

RESULTS
Morphological and main component determination by SEM/EDXA
Typical aerosol particles from anthropogenic sources, sea salt as well as from mineral dust and ammonium sulphate are exemplarily shown together with EDXA spectra in the following section.

Aerosol characterization by SEM/EDXA
Morphological characterization of aerosol samples as well as determination of main components were performed by SEM/EDXA.

SUMMARY AND OUTLOOK
Concentrations of mineral dust and anthropogenic elements are a factor 3-10 higher during Haze events than in background situations in spring time. This is in agreement with data from remote sensing methods (Lidar, Stelphotometer). Measurements with the eight stage impactor show higher element concentrations for mineral dust and anthropogenic elements as well as different size distributions.

Further investigations have to be done to connect the chemical and morphological data with remote sensing data.

Future campaigns (spring 2004) will be used also for measurements of aerosol concentration with improved systems.