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Automated flask sampling of atmospheric trace gases in the Arctic

Measurements of minor trace gases and isotope signatures in the atmosphere help to understand the origin of air masses, and the sources and sinks on the ground they interacted with. New data from remote locations can thus help us understand better what controls the surface-atmosphere exchange fluxes over oceanic and terrestrial Arctic regions, and how signals are affected by environmental changes.

The automated flask sampler will facilitate air mass characterization at regular intervals (2-3 times per week). This will improve the identification of air mass origin and carbon sources. A targeted sampling mode will allow to focus on e.g. air masses with high carbon content.

The sampler will close key gaps in the Arctic monitoring network, and new information on minor trace gases and isotopes will improve our ability to constrain carbon emissions through atmospheric inverse modeling.

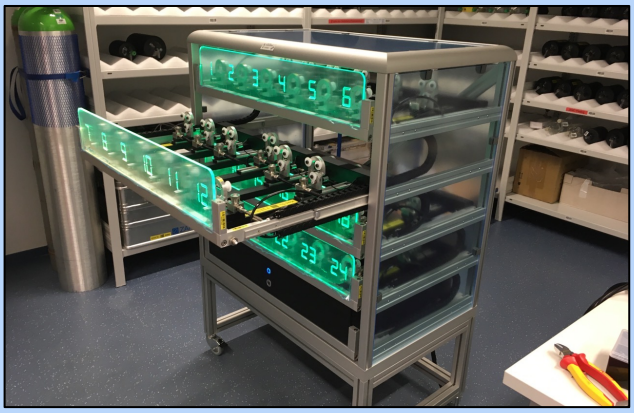

Figure 1. Photo of the flask sampler location

Location: Station North, Greenland

Observations:
trace gases (e.g. N_2O, SF_6, CO, O_2/N_2)
isotopes signatures (e.g. $^{13}C\text{-}CO_2$, ^{18}O)

Sampling scheme
Fixed intervals (weekly)
Targeted samples (e.g. GHG peaks)

Data access
MPI-BGC data repository
ICOS database

This new data product specifically targets the atmospheric transport modeling community.

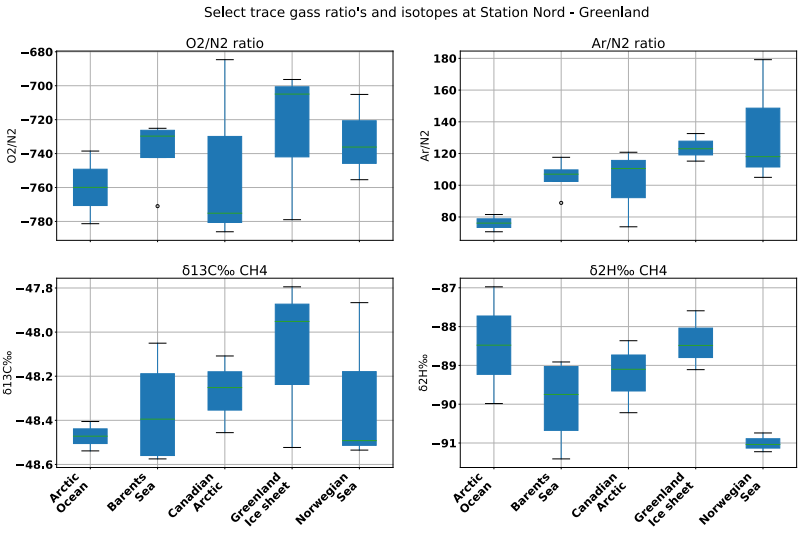

Figure 2. Example of trace gas ratio's and isotopes in different Arctic regions

INTAROS has received funding from EU's Horizon 2020 research and innovation programme - Grant Agreement No 727890