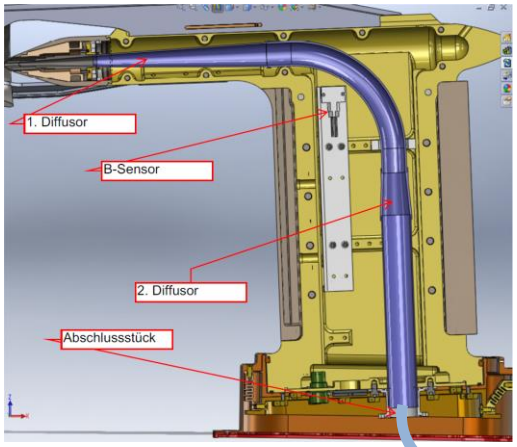
B03-TROPOS: Counterflow Virtual impactor (CVI) inlet

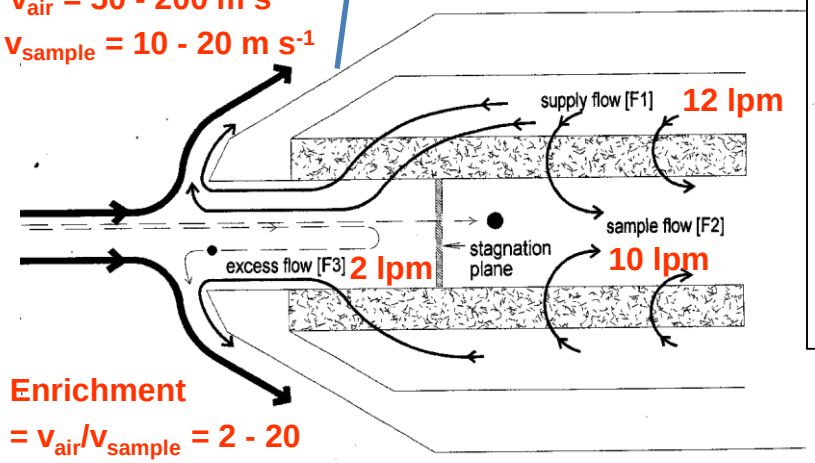
In-situ cloud particle sampling to study aerosol cloud interactions



Identify which ambient particles form drops and ice particles in arctic clouds: sampling, evaporation of drops/ice particles and measurement of the residual particle aerosol properties (sources: natural (e.g., open sea), anthropogenic (local, transported)

v_{air} = 50 - 200 m s^{-1}

v_{sample} = 10 - 20 m s^{-1}



Enrichment = v_{air}/v_{sample} = 2 - 20

MPI-C:

- ALABAMA:
  - single particle chemical composition
- Grimm-OPC:
  - size distribution
  - number conc. (250 nm – 30 µm)

TROPOS:

- CPC TSI-3010:
  - number conc. (> 10 nm)
- UHSAS:
  - size distribution
  - number conc. (60 – 1000 nm)
- PSAP:
  - absorption coefficient, black carbon mass
- Filter samples:
  - chemical composition

AWI:

- SP2:
  - single particle BC number conc
- UHSAS:
  - size distribution
  - number conc. (60 – 1000 nm)

Inside cloud: excess flow on → cloud residuals

Outside cloud: excess flow off → ambient particles

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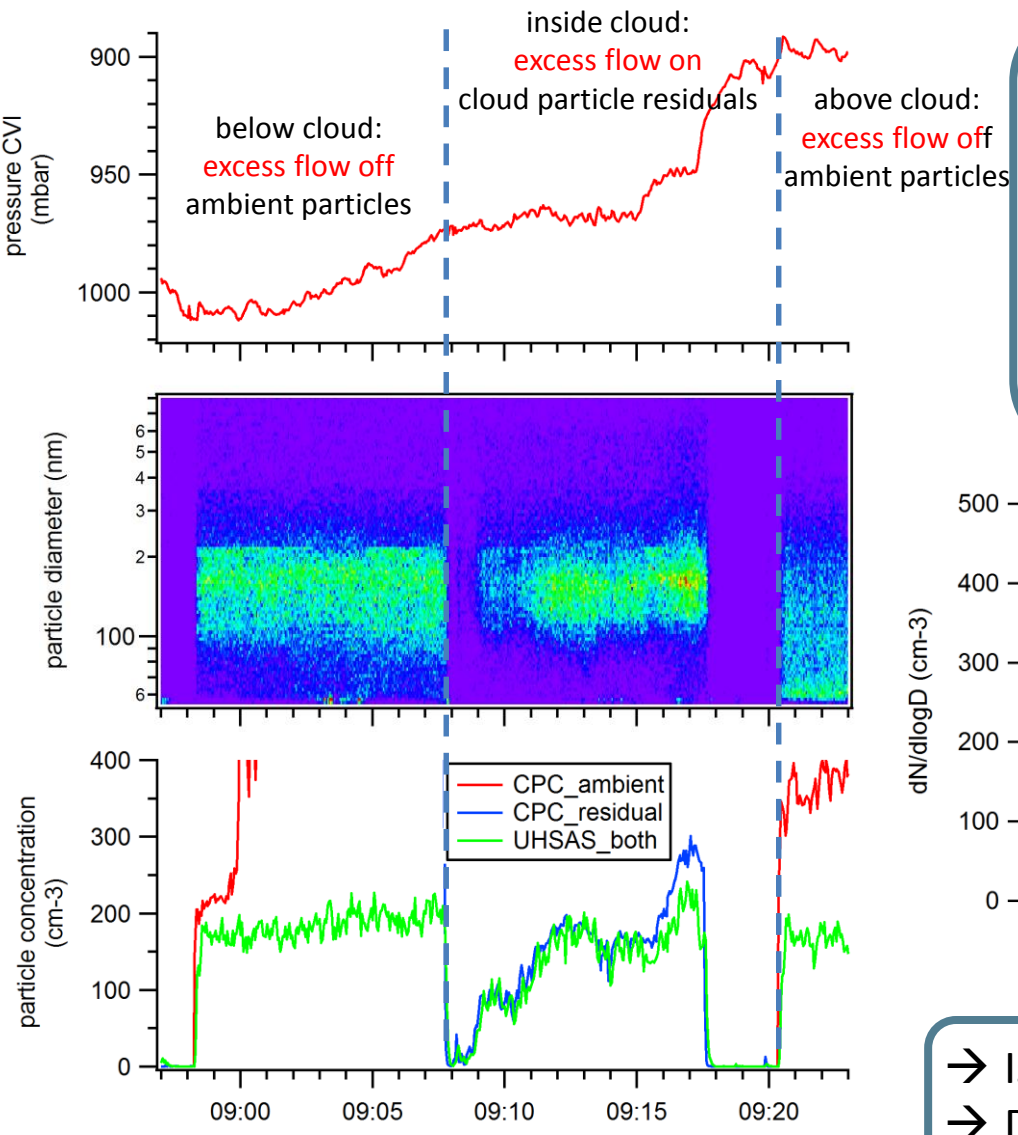
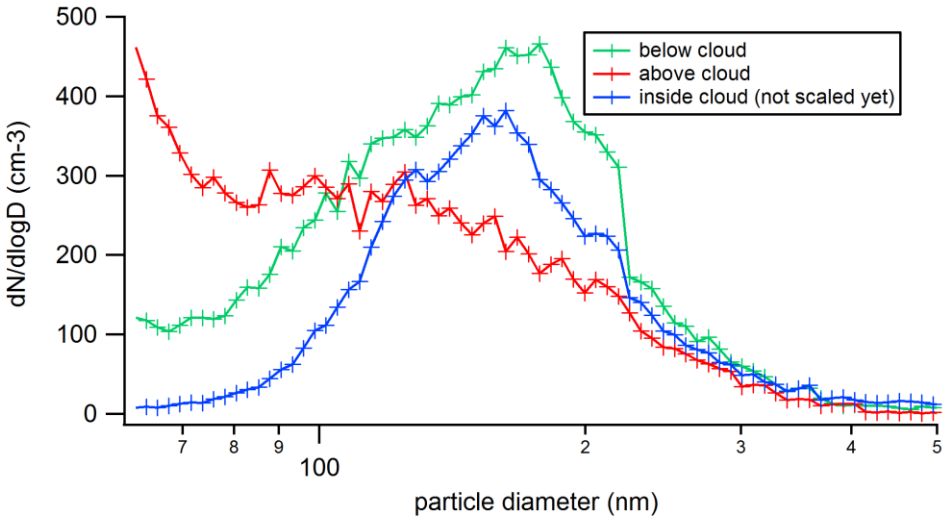


Flight 11: 02.06.2017: low CVI excess flow:

→ Detection of residuals from drops (dominating) and ice particles:

→ Much less smaller particles below than above cloud (different sources?)

→ Similar below and inside cloud size distribution (sea salt?)



→ Is this a general feature?

→ Differences over open water and ice surface?

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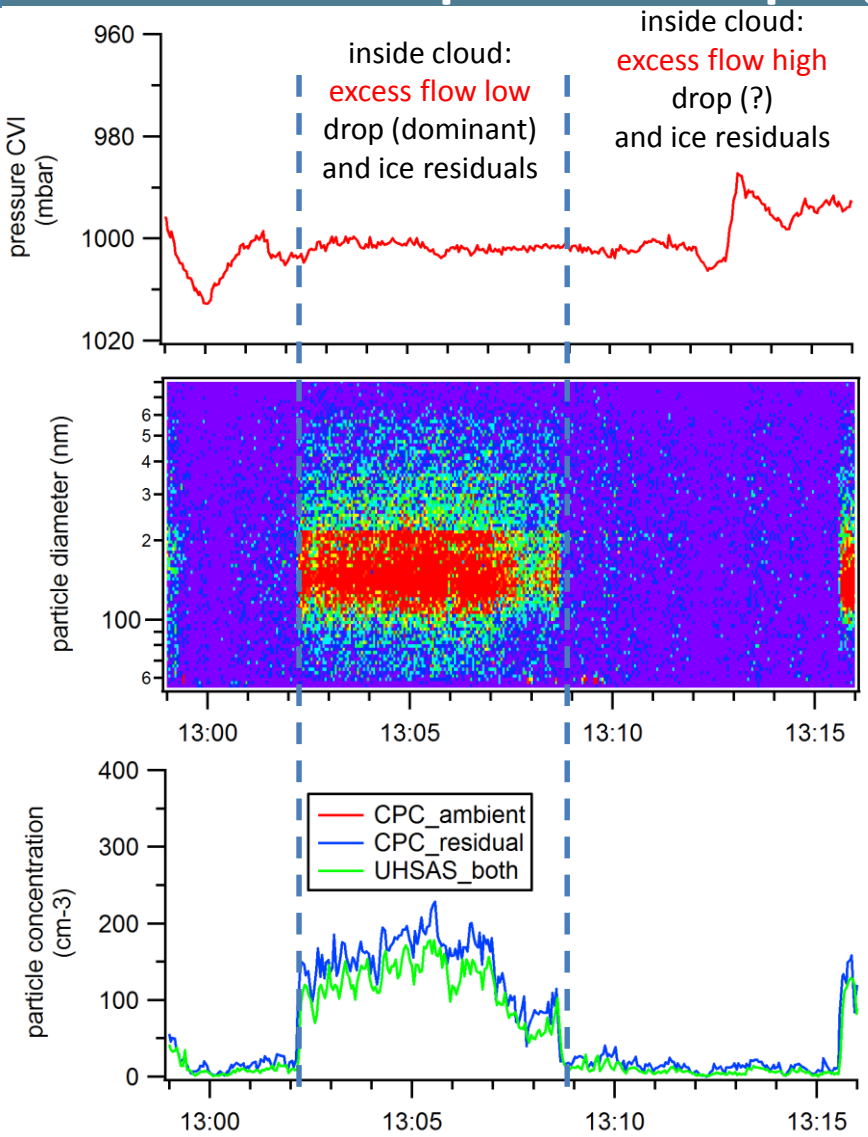
In-situ cloud particle sampling to study aerosol cloud interactions

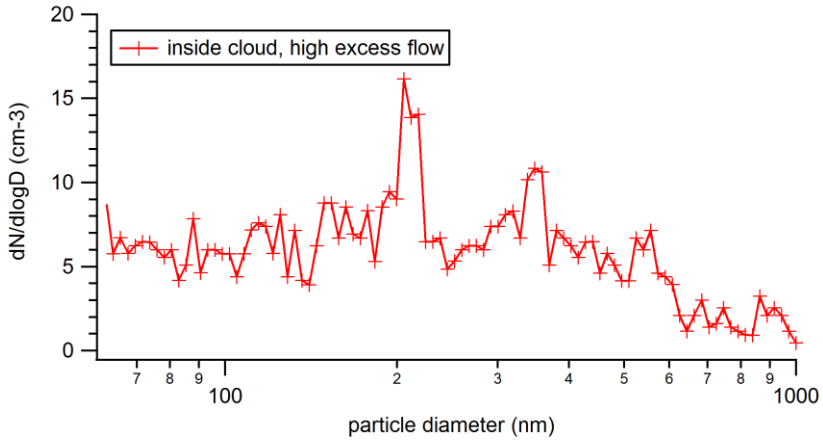


Flight 11: 02.06.2017: high CVI excess flow:

→ Detection of residuals from ice particles and few large few drops(?):

→ Much less detected residuals

→ Different size distribution for ice particle residuals compared to drop residuals



→ Is this a general feature, when cloud ice particles (not precipitation) are seen by the cloud probes?

→ Is there a difference in the chemical composition between drop and ice particle residuals?