

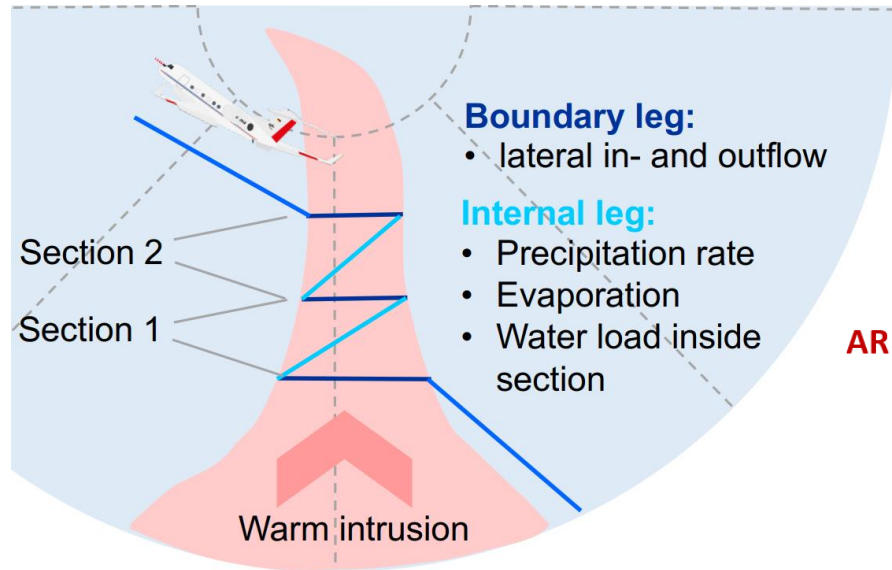
Radar and Sonde-based Moisture and Precipitation in Arctic ARs/WAIs

A perspective on gained measurements during
RF02/RF03 and RF05/RF06

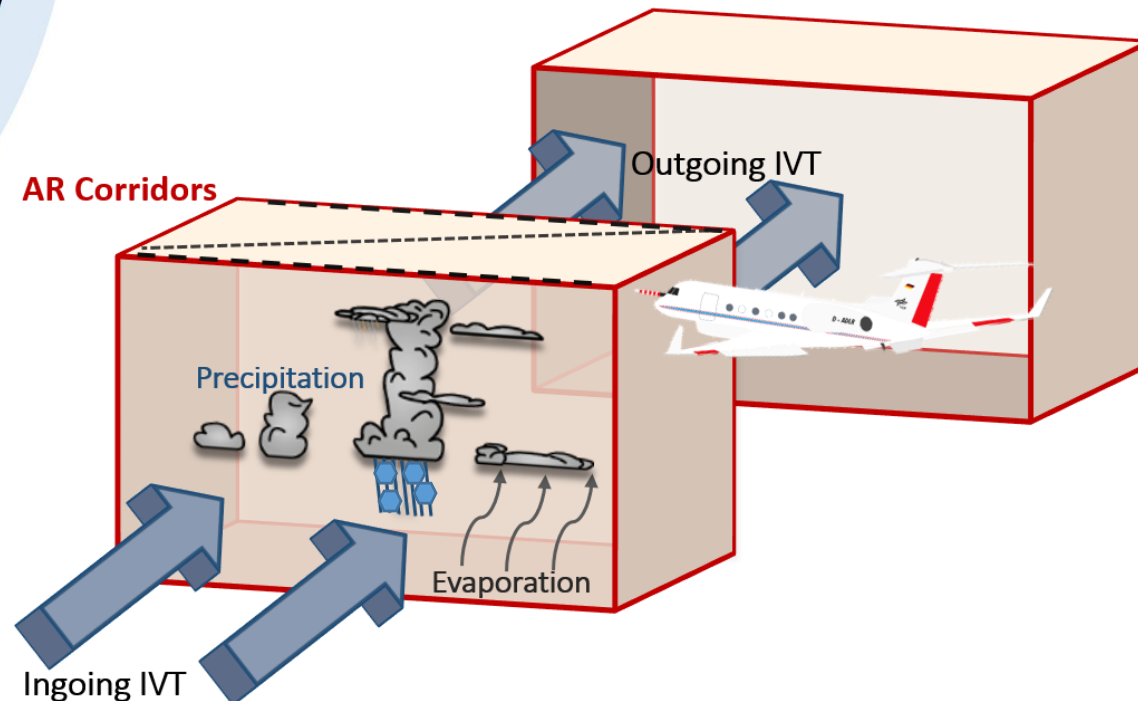
General aim: AR/WAI budget closure

Analysing the moisture budget in corridors along large-scale transports is key to understand the spatio-temporal airmass evolution and their precipitation efficiency

→ accuracy in budget components essential



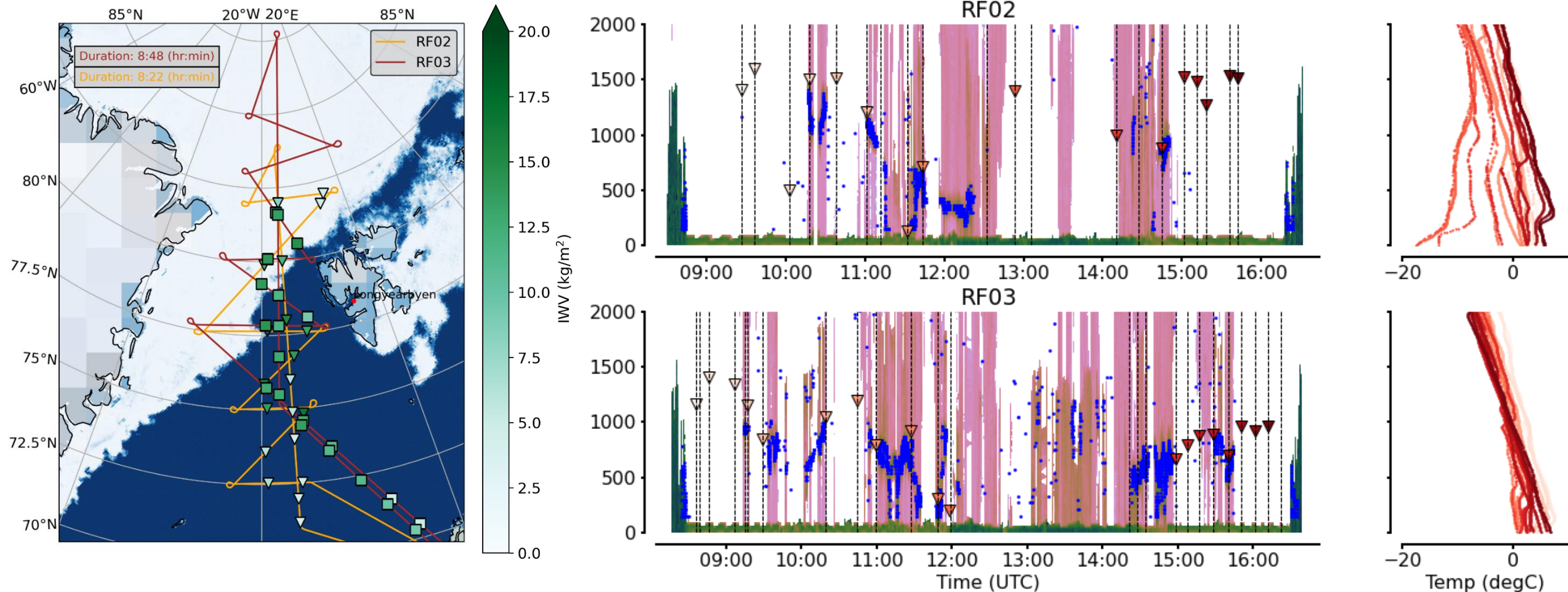
$$\frac{\delta IWV}{\delta t} = E - P + \nabla IVT$$



Two events with consecutive flights (WAI/AR)

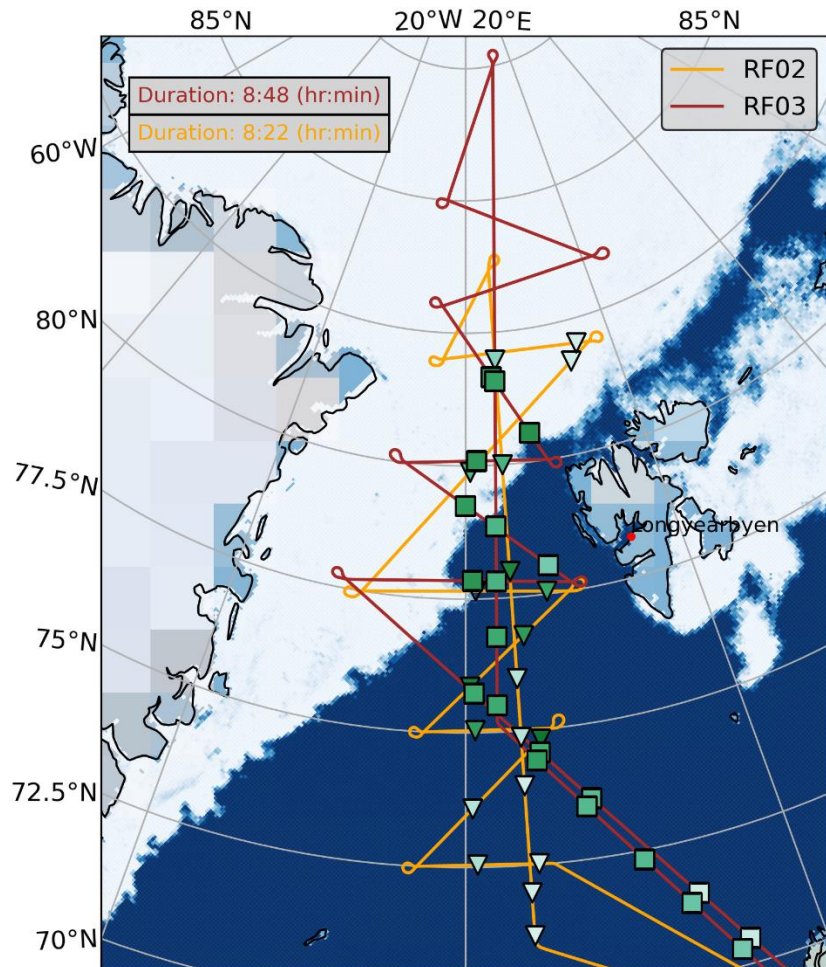
Airmass Impact of WAI on Precipitation Phase

WAI: RF02/RF03

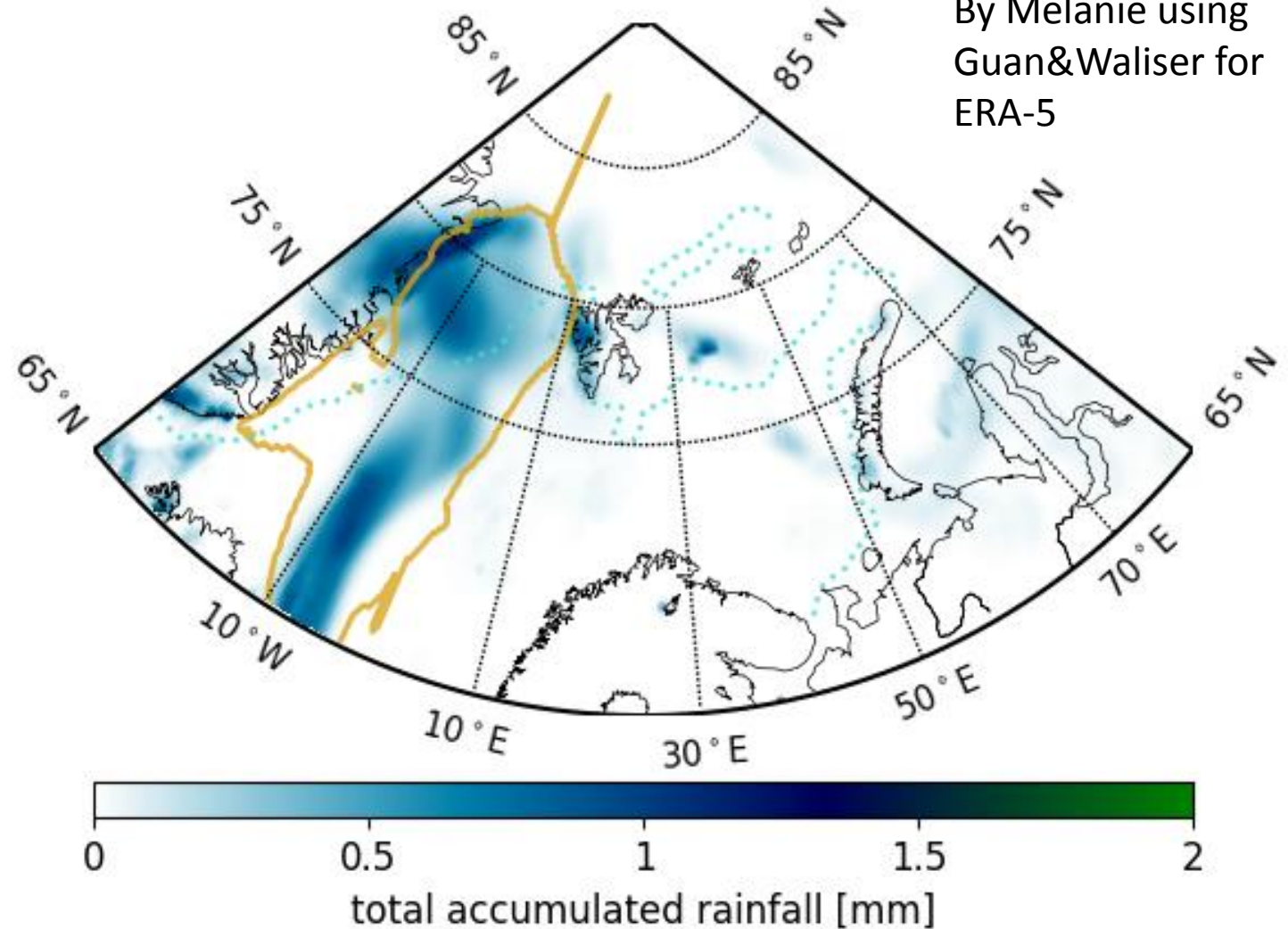


Two events with consecutive flights:

WAI: RF02/RF03

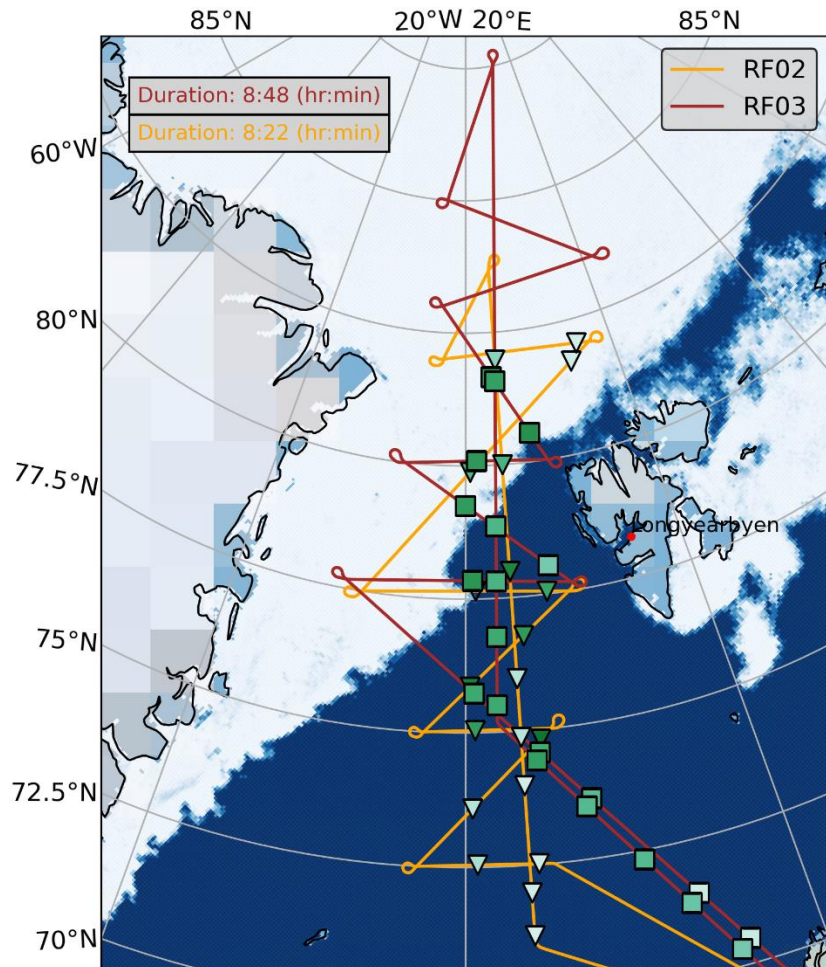


AR: RF05/RF06

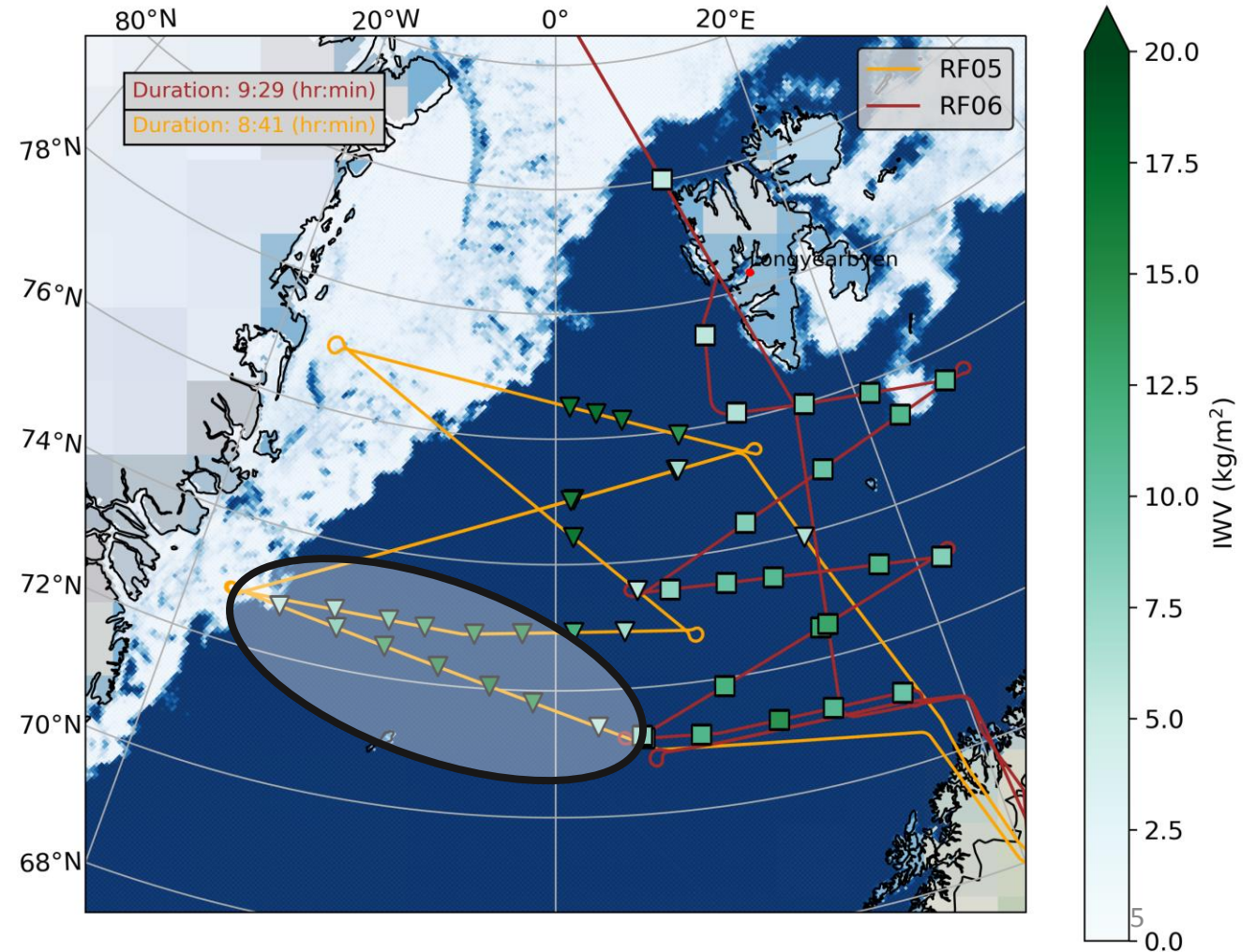


Two events with consecutive flights:

WAI: RF02/RF03

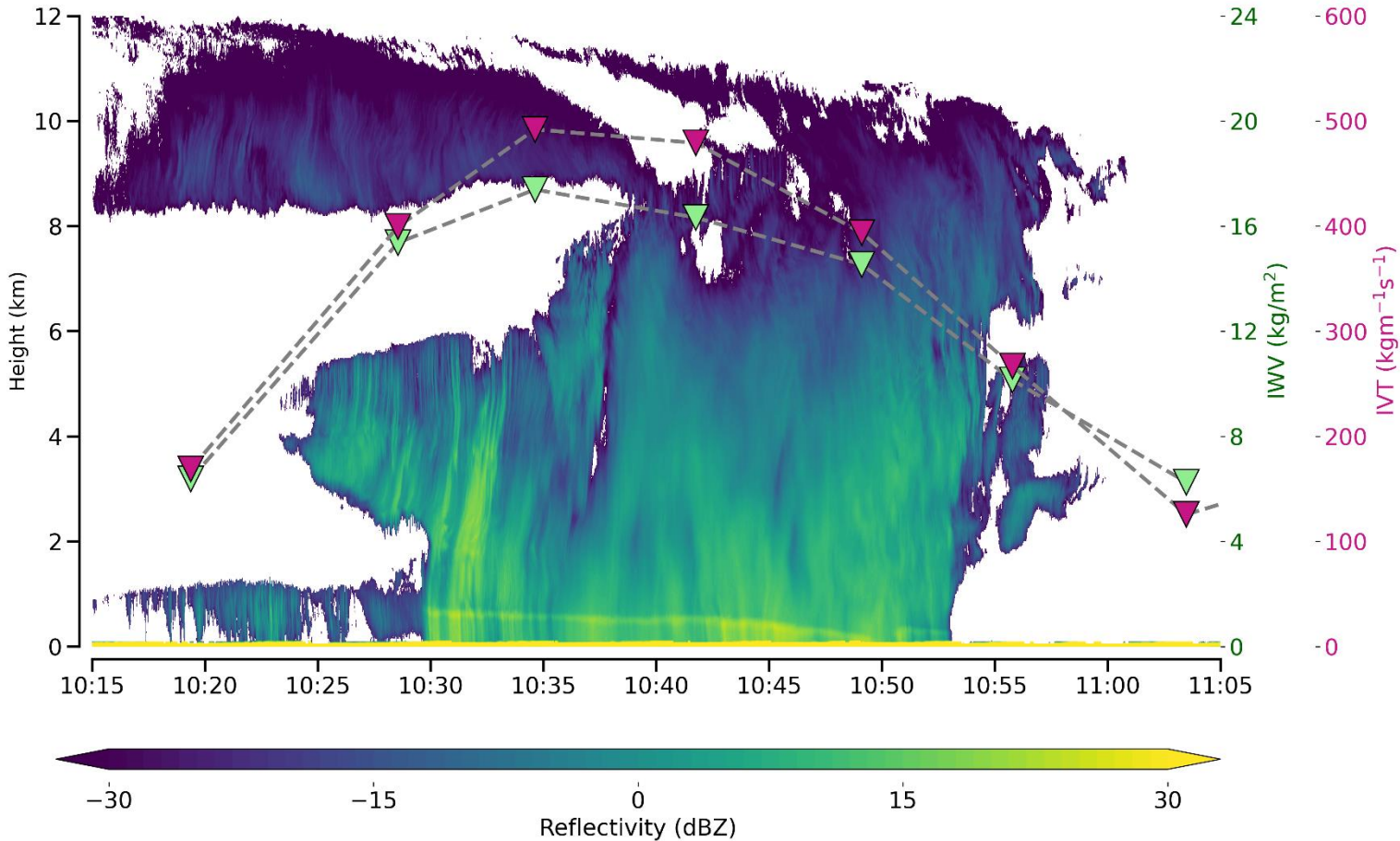
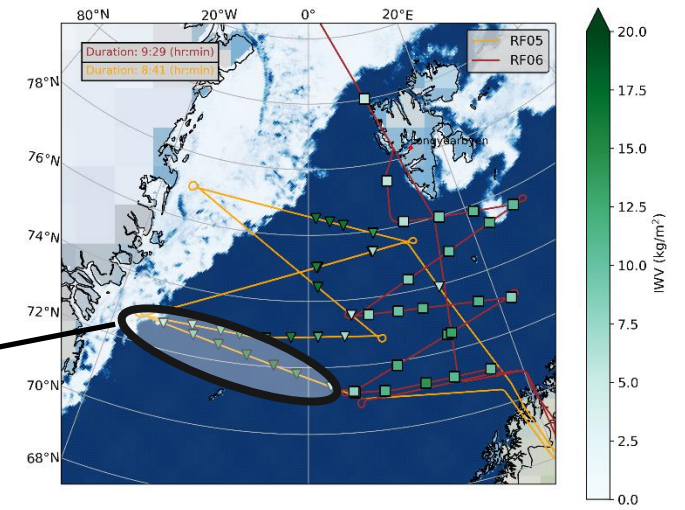


AR: RF05/RF06



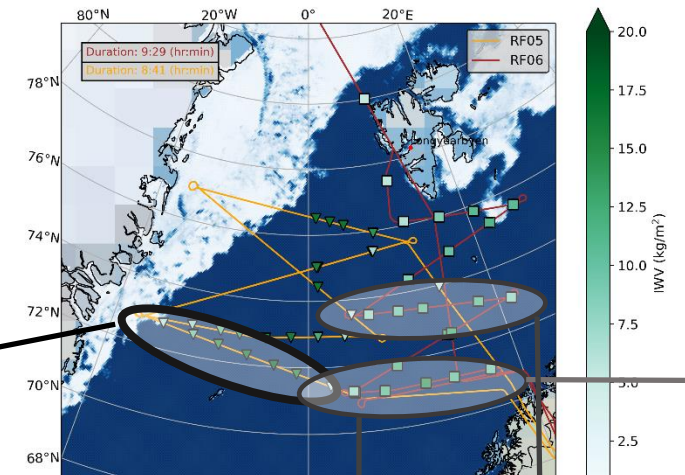
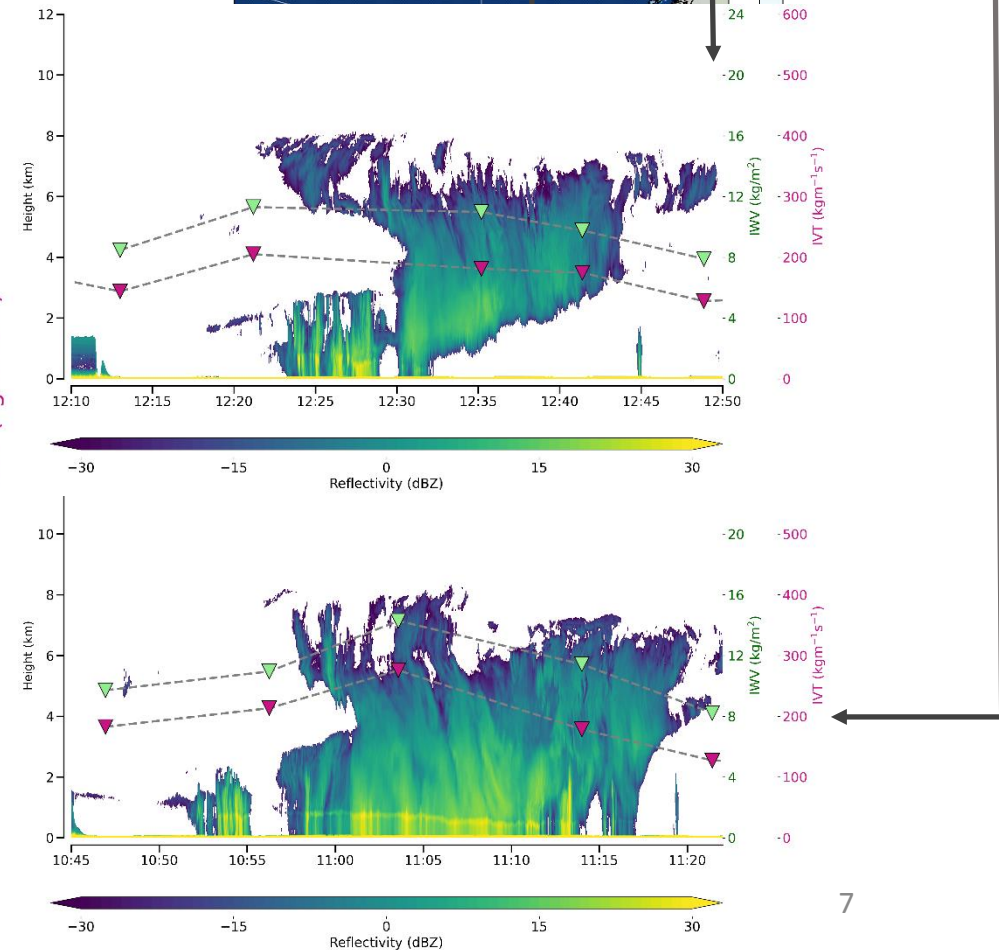
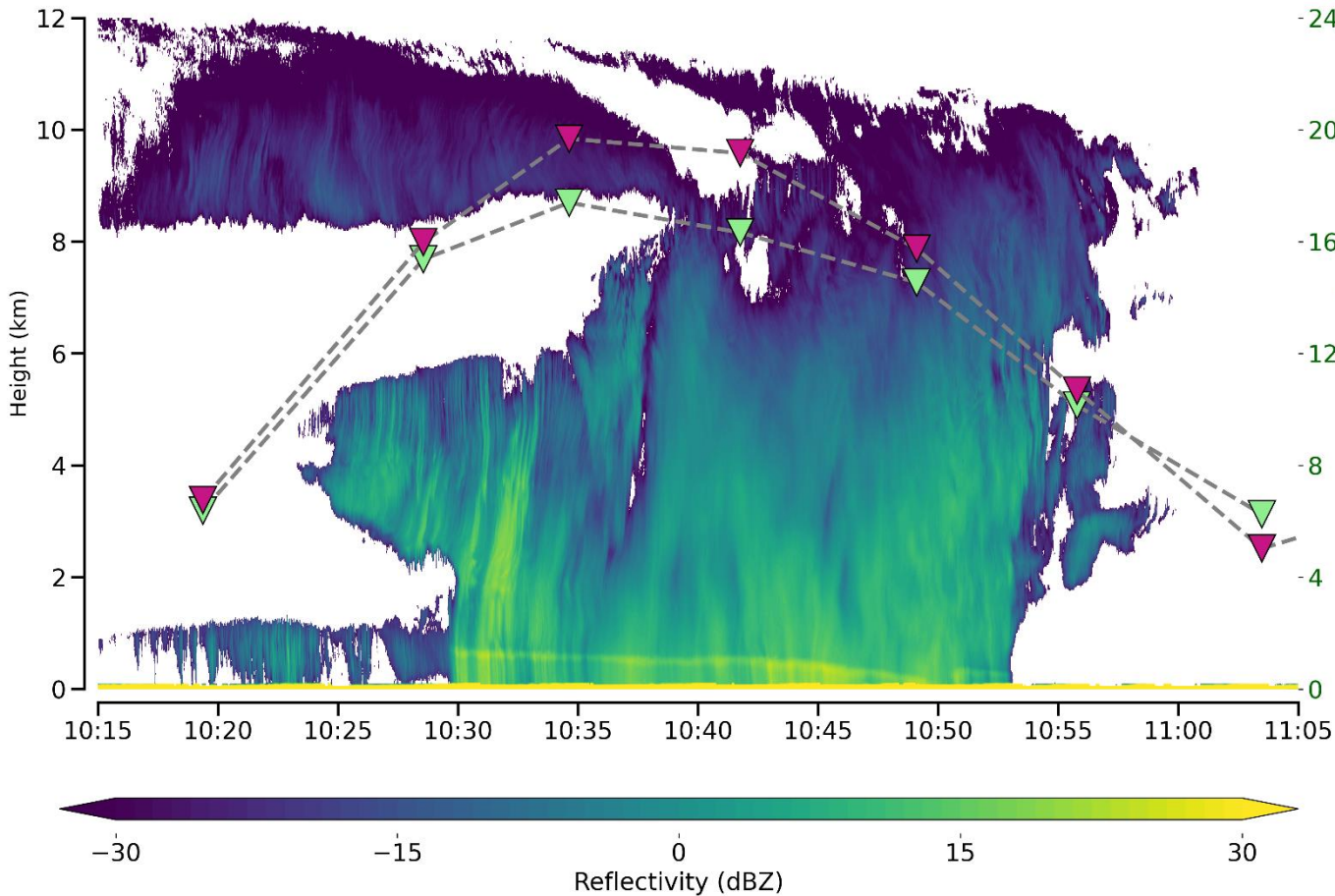
Atmospheric Rivers (ARs)

- Strong precipitation with high reaching snow band in the core.
- Melting layer descends towards cold sector.
- Cirrus clouds up to 12 km
- Strong IVT $\sim 500 \text{ kgm}^{-1}\text{s}^{-1}$



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Conclusion

- Strong meridional transport captured.
- Intense warming(WAI)/ precipitation (AR) identified from consecutive flights.
- WAI leads to increases in melting layer.
- AR shows strong variability along cross-section
- **Lots of dropsondes (pre-frontal) were released, but still lack of data in post-frontal section (where IVT converges and trigger precipitation)**
- AR moisture budget closure of pre-frontal AR section can be conducted from data.