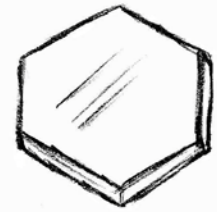


High resolution measurement of mixed phase cloud and precipitation by aircraft penetration

John Hallett and German Vidaurre
Desert Research Institute



Cloud particles



10 μm

10 μm

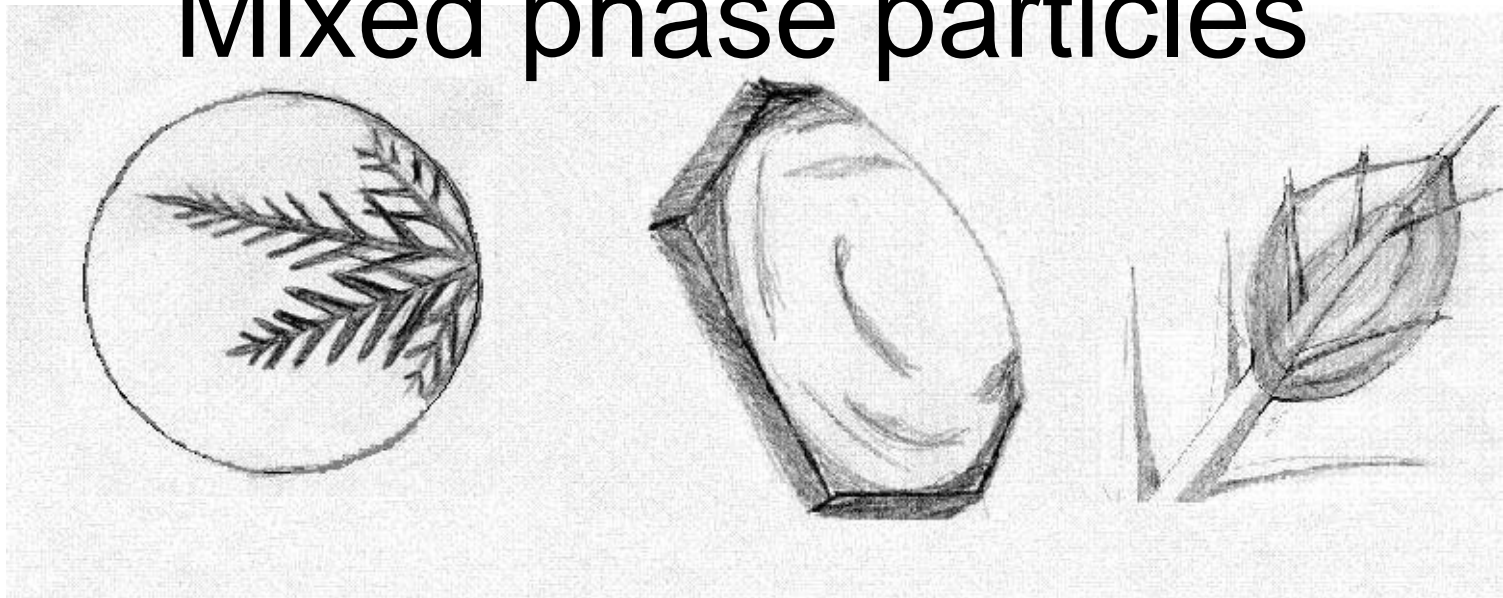
10 μm

100 μm

100 μm

50 μm

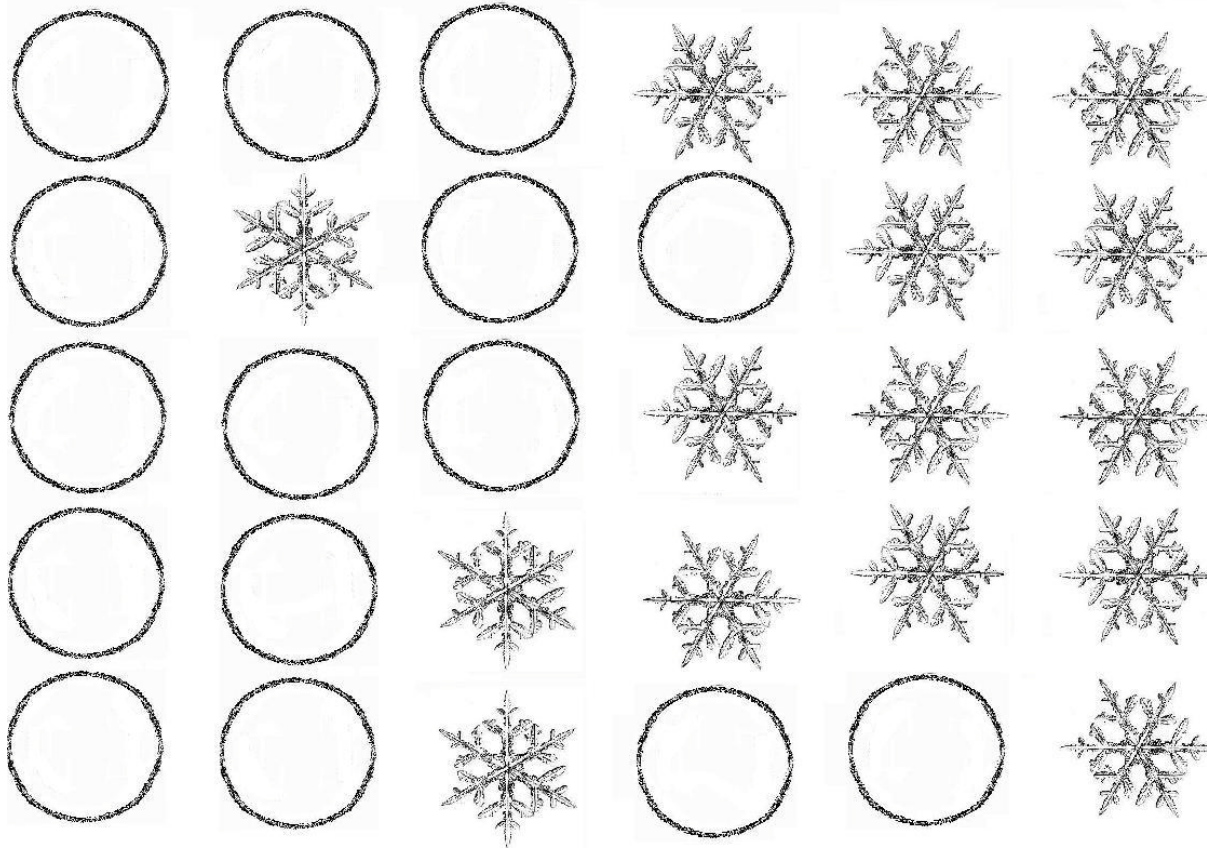
Mixed phase particles



Freezing droplet

melting ice crystals

**All
water**

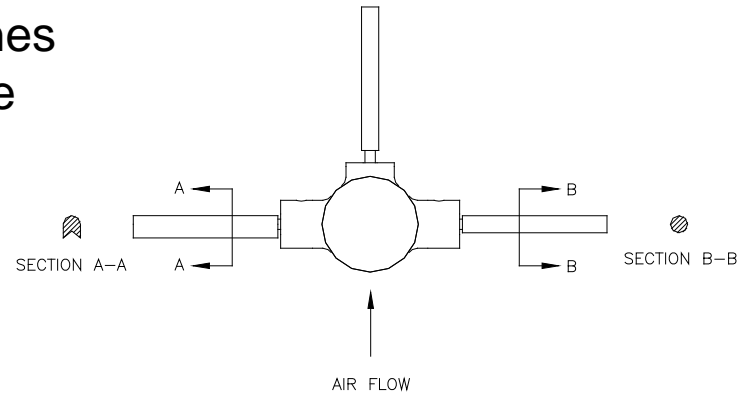


**All
ice**

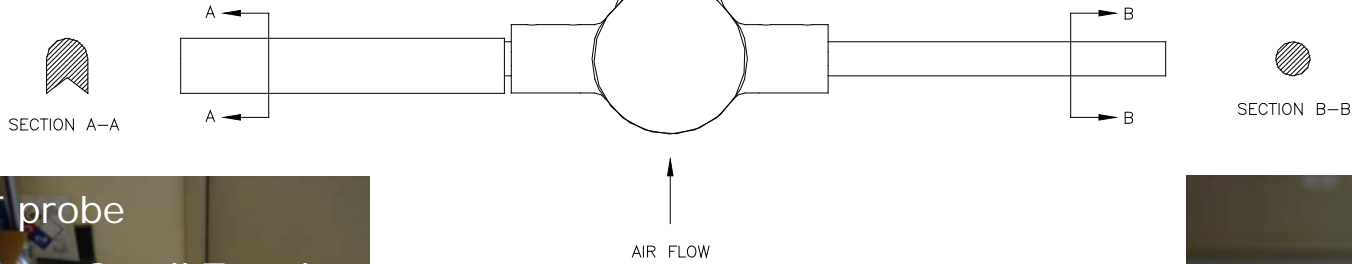
Mixed phase cloud



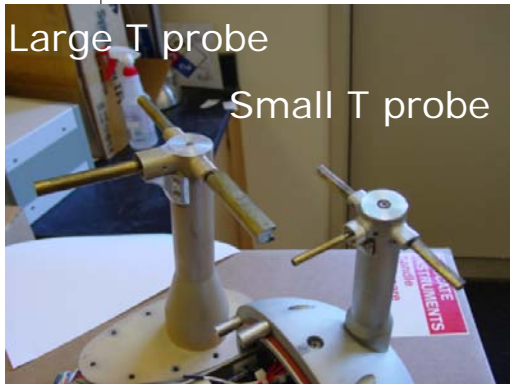
Backward rod catches nothing; to calibrate for temperature



Indented rod catches liquid and solid



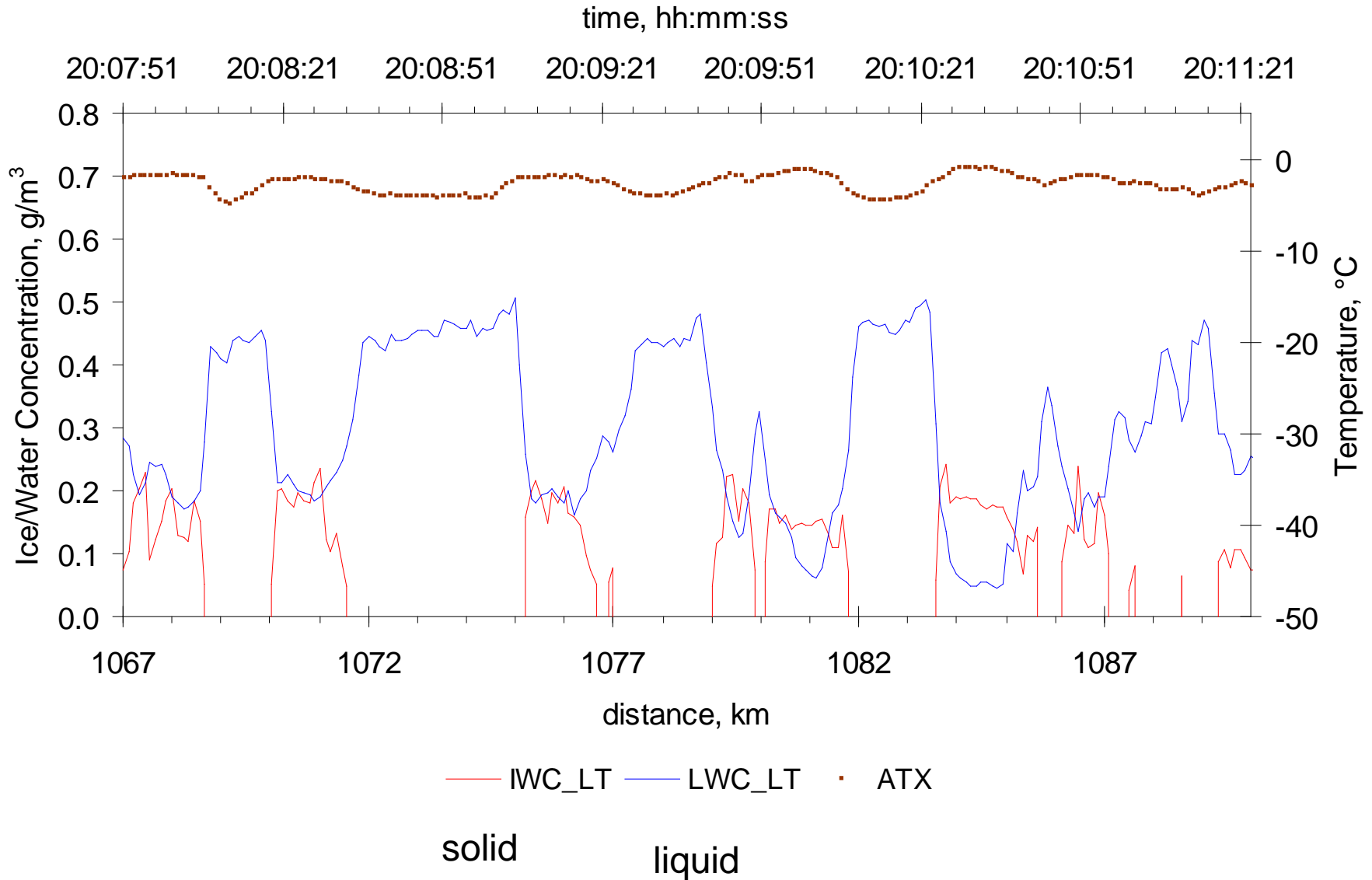
Round rod catches only liquid



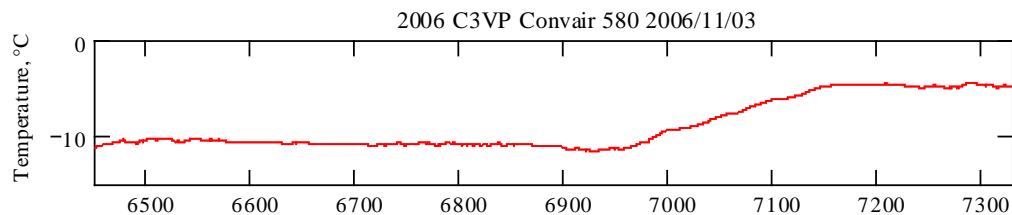
Difference is Ice

Heat/power is applied to get same as backward rod

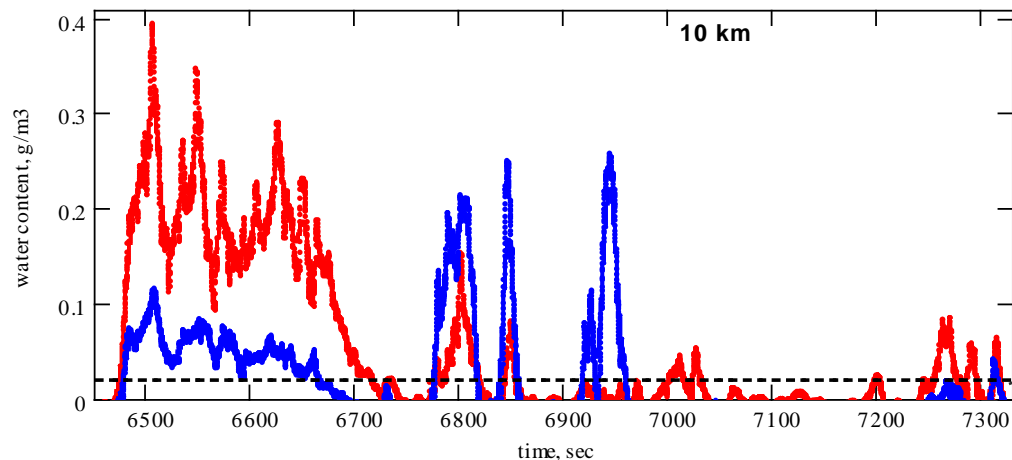




T-probe high resolution 1/10 sec data ice, water, and ice/total (ice + water) ratio

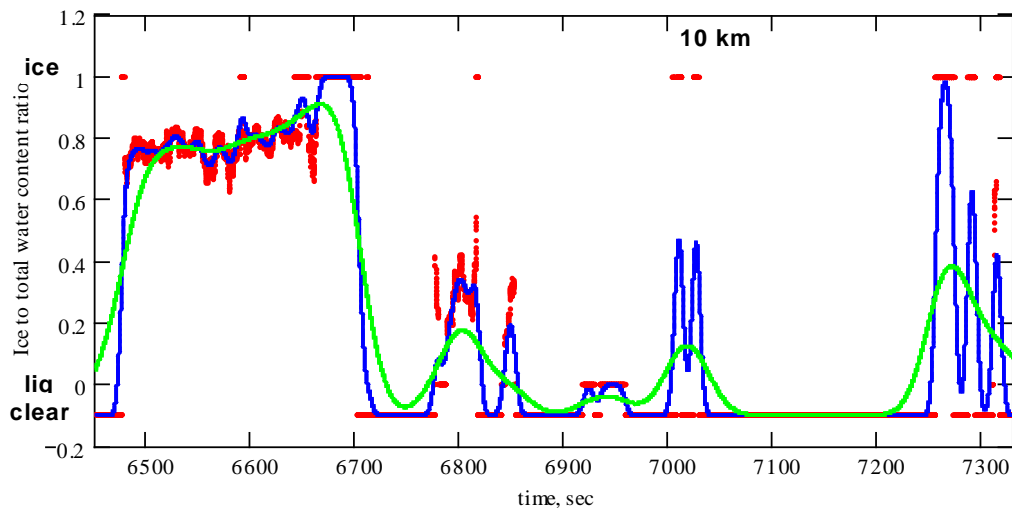


Start time 20:10:04



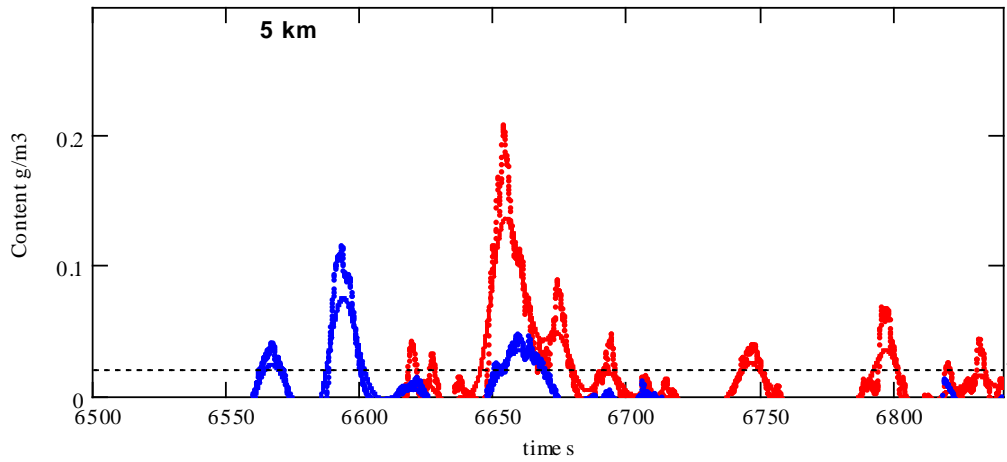
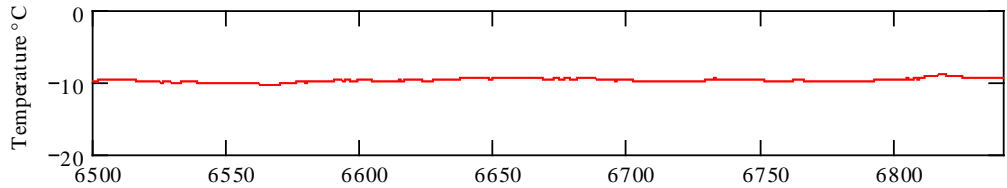
- ICE 1/10s data
- ICE 1s running average
- LW 1/10s data
- LW 1s running average

Uncertainty



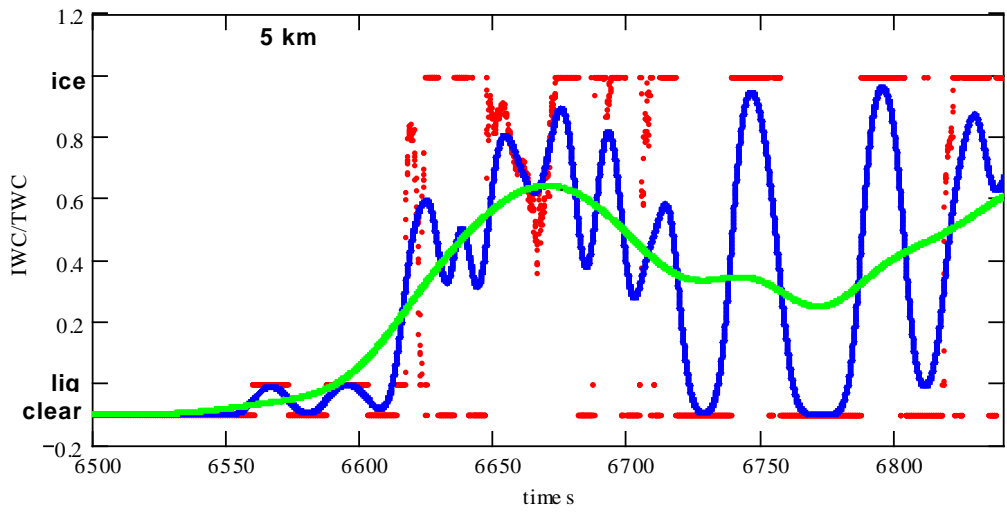
- IWC/TWC 1/10s data
- IWC/TWC 1s average
- IWC/TWC 5s average

2006 C3VP Convair 580 2007/01/19 F17

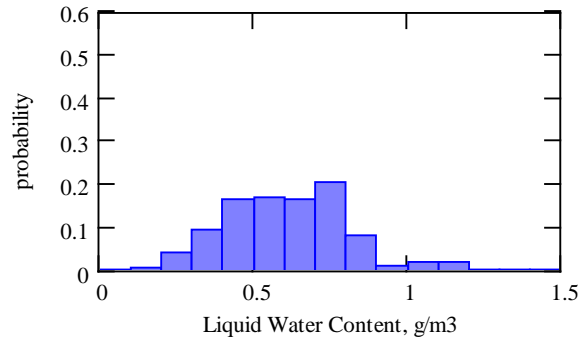
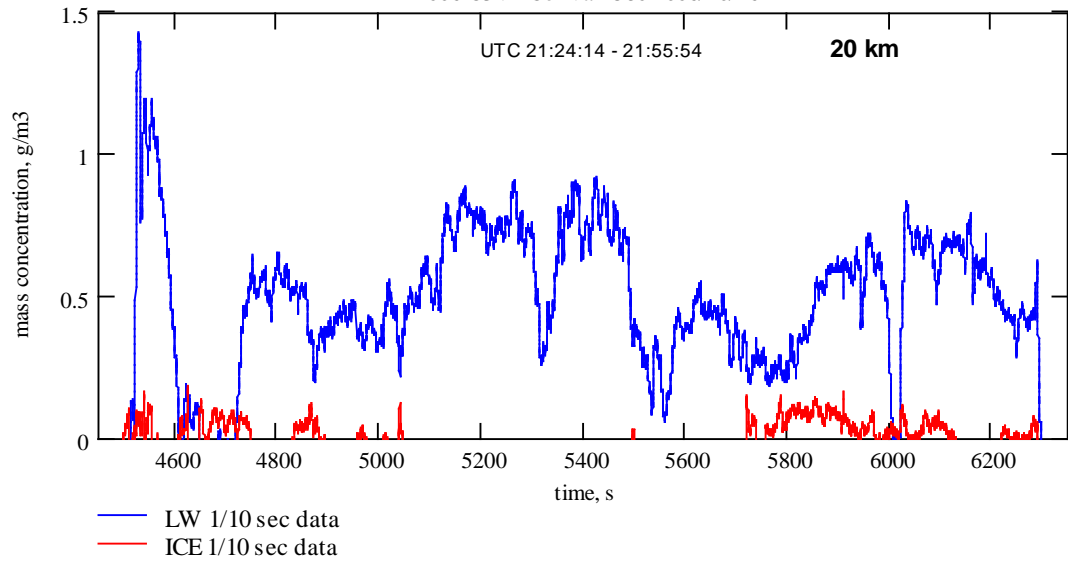


- ICE 1/10s data
- ICE 1s running average
- LW 1/10s data
- LW 1s running average

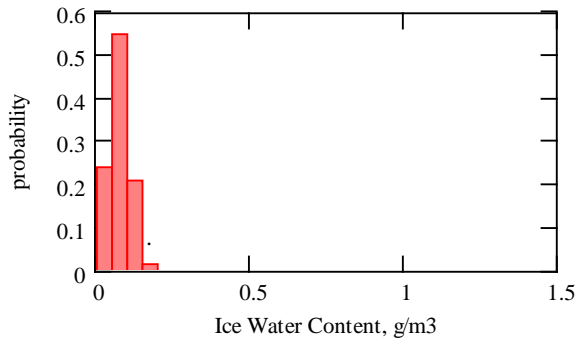
Uncertainty

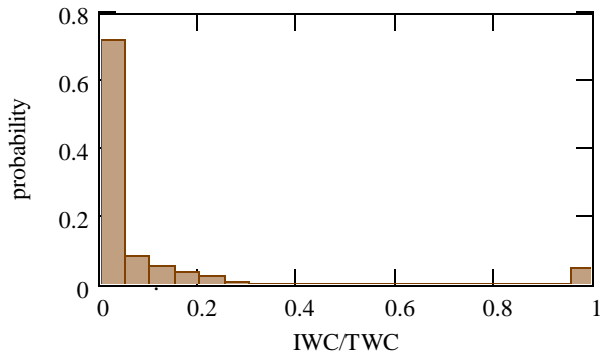
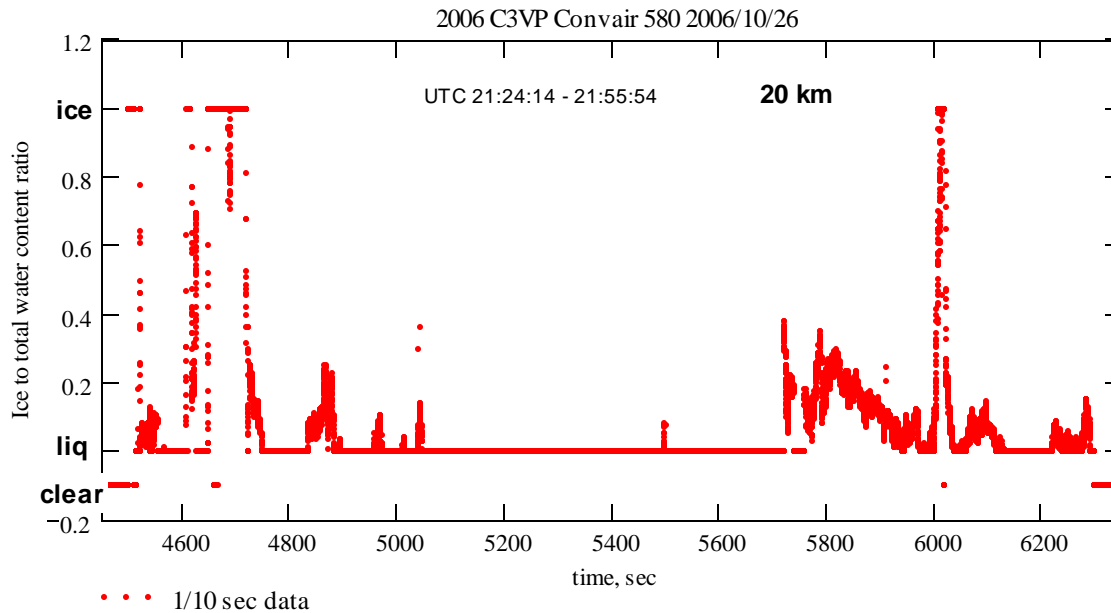


- IWC/TWC 1/10s data
- IWC/TWC 1s average
- IWC/TWC 5s average



Probability plots show the chances of having a specific water (blue) or ice (red) content for the specific interval considered.





Probability plots show the chances of having a specific IWC/TWC for the given interval; all water is a single bar on the left at zero, all ice is a single bar on the right at one.