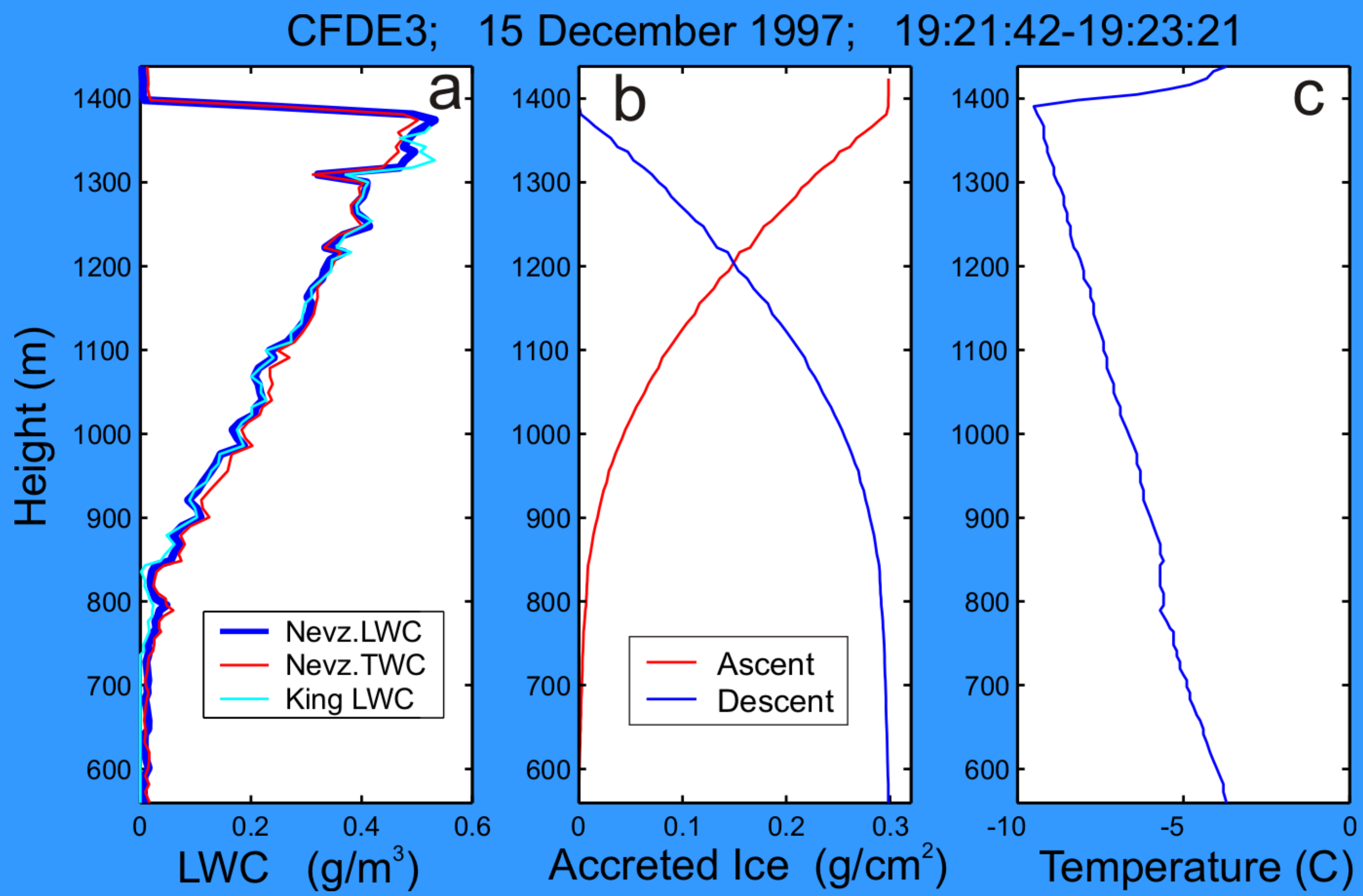
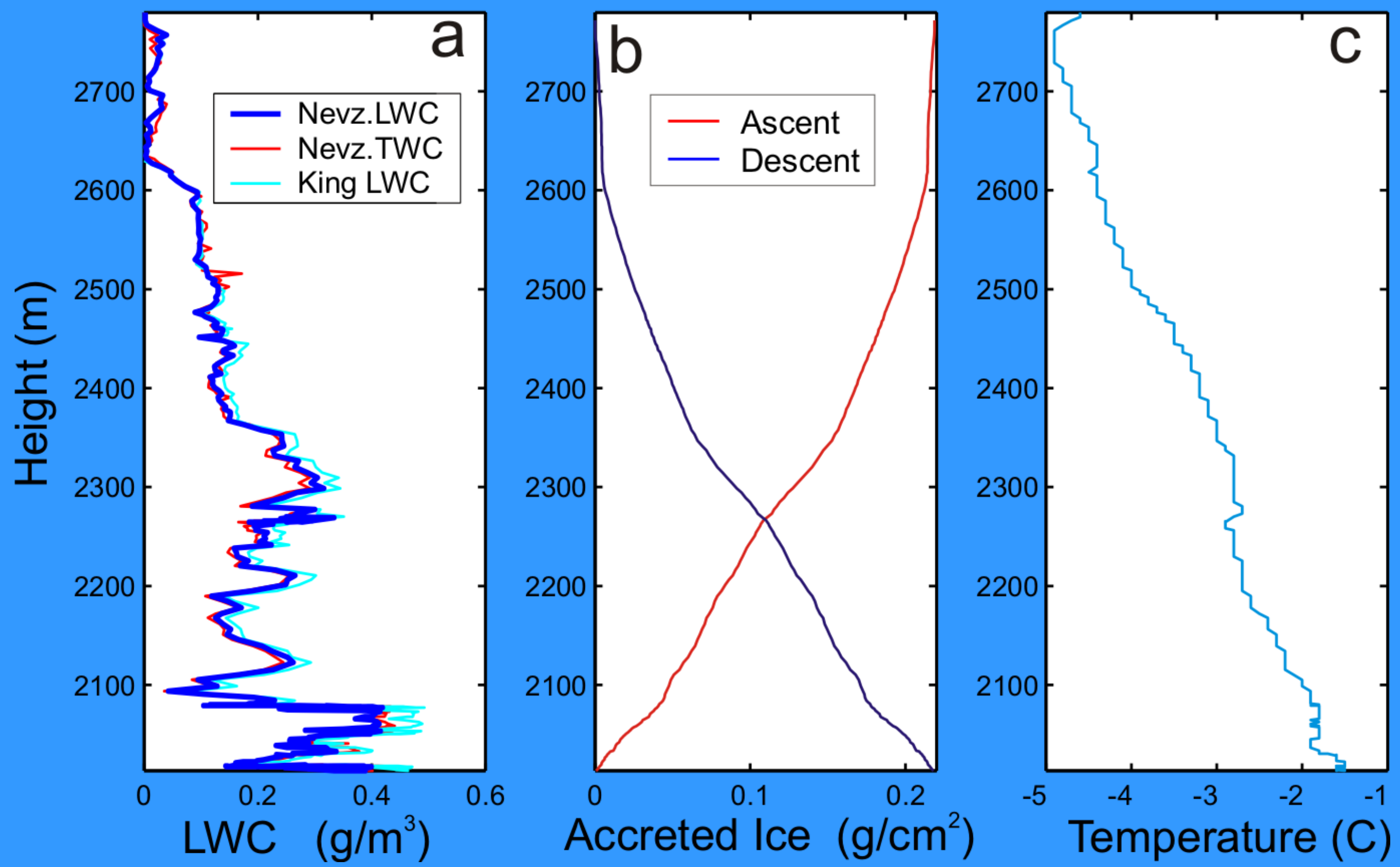
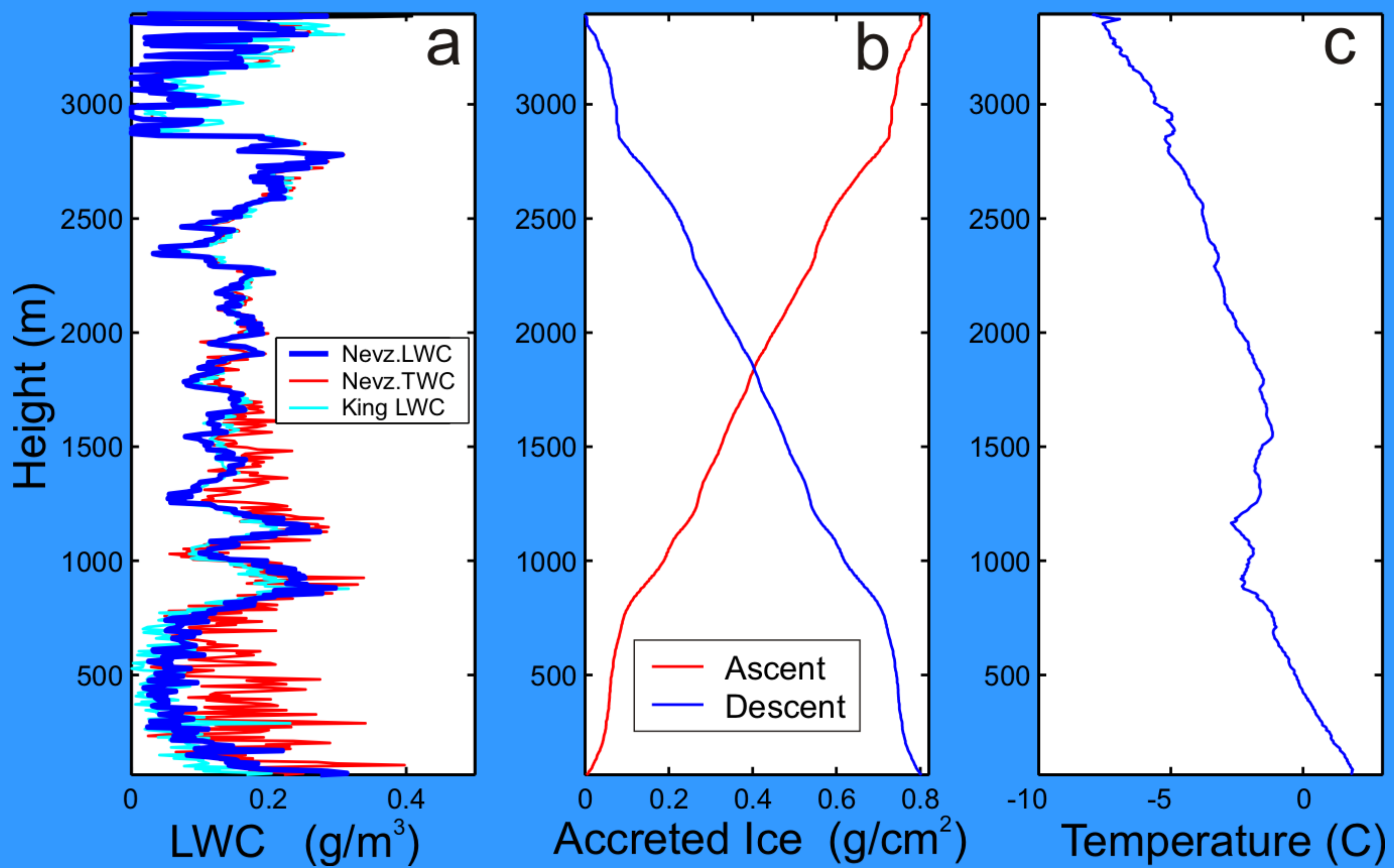

CFDE3; 15 December 1997; 19:21:42-19:23:21
a
b
c
Height (m)
1400
1300
1200
1100
1000
900
800
700
600
Nevz.LWC
Nevz.TWC
King LWC
0
0.2
0.4
0.6
LWC (g/m3)
Ascent
Descent
0.1
0.3
Accreted Ice (g/cm2)
-10
-5
Temperature (C)

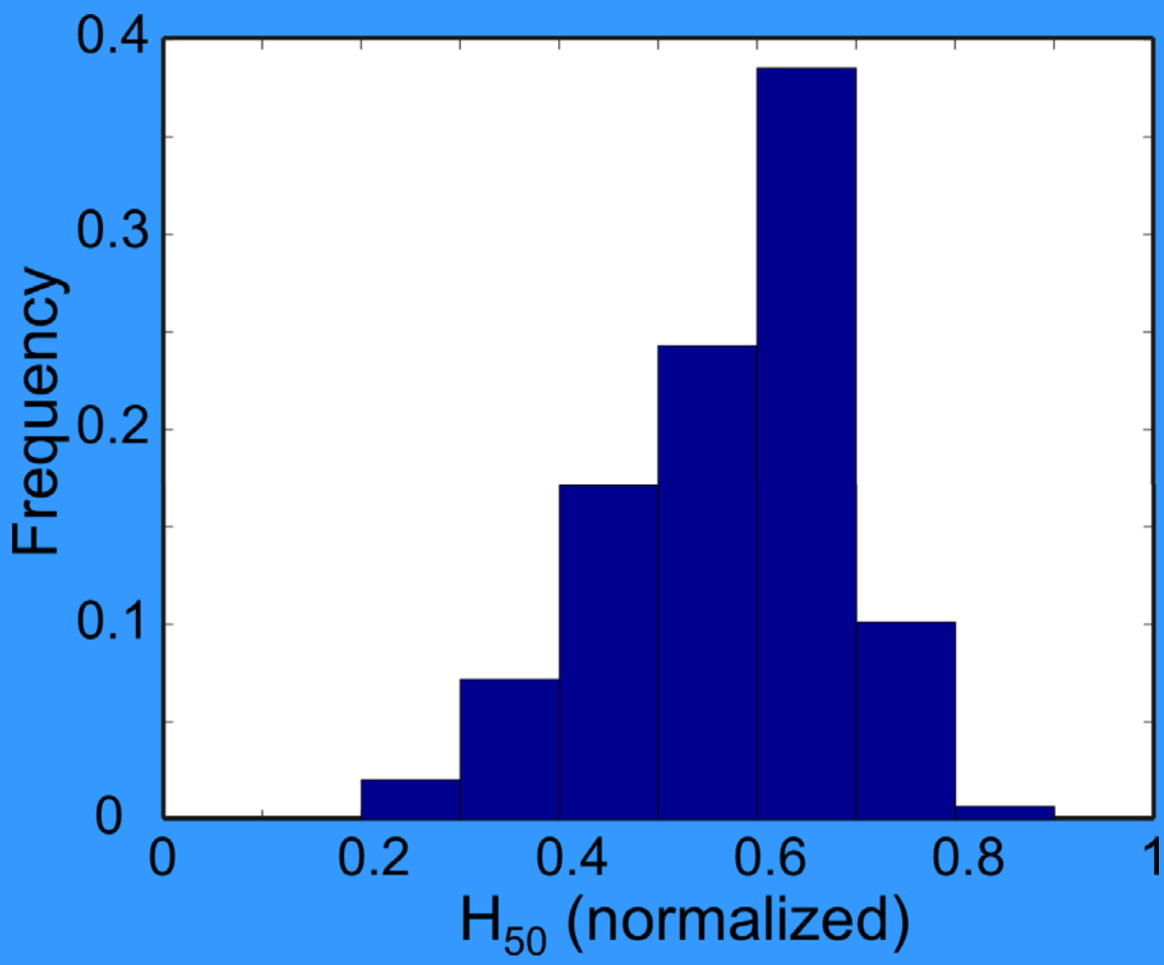
CFDE1; 22 March 1995 14:47:55-14:52:44



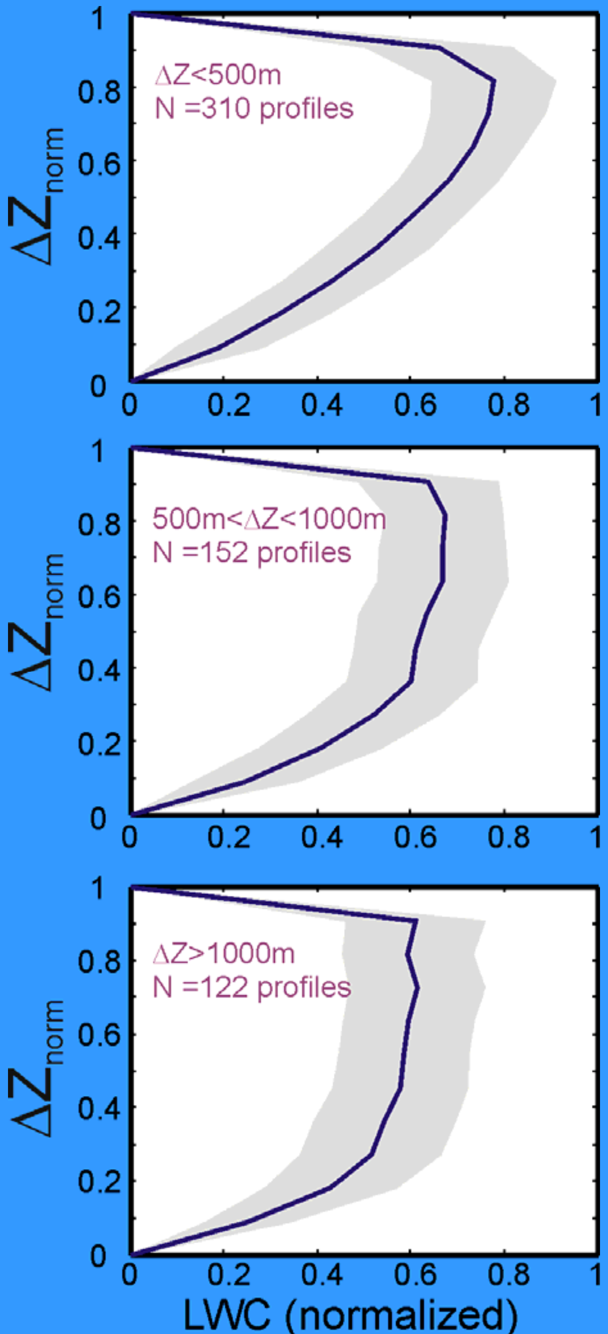
AIRS2; 11 November 2003 19:24:22-19:33:18



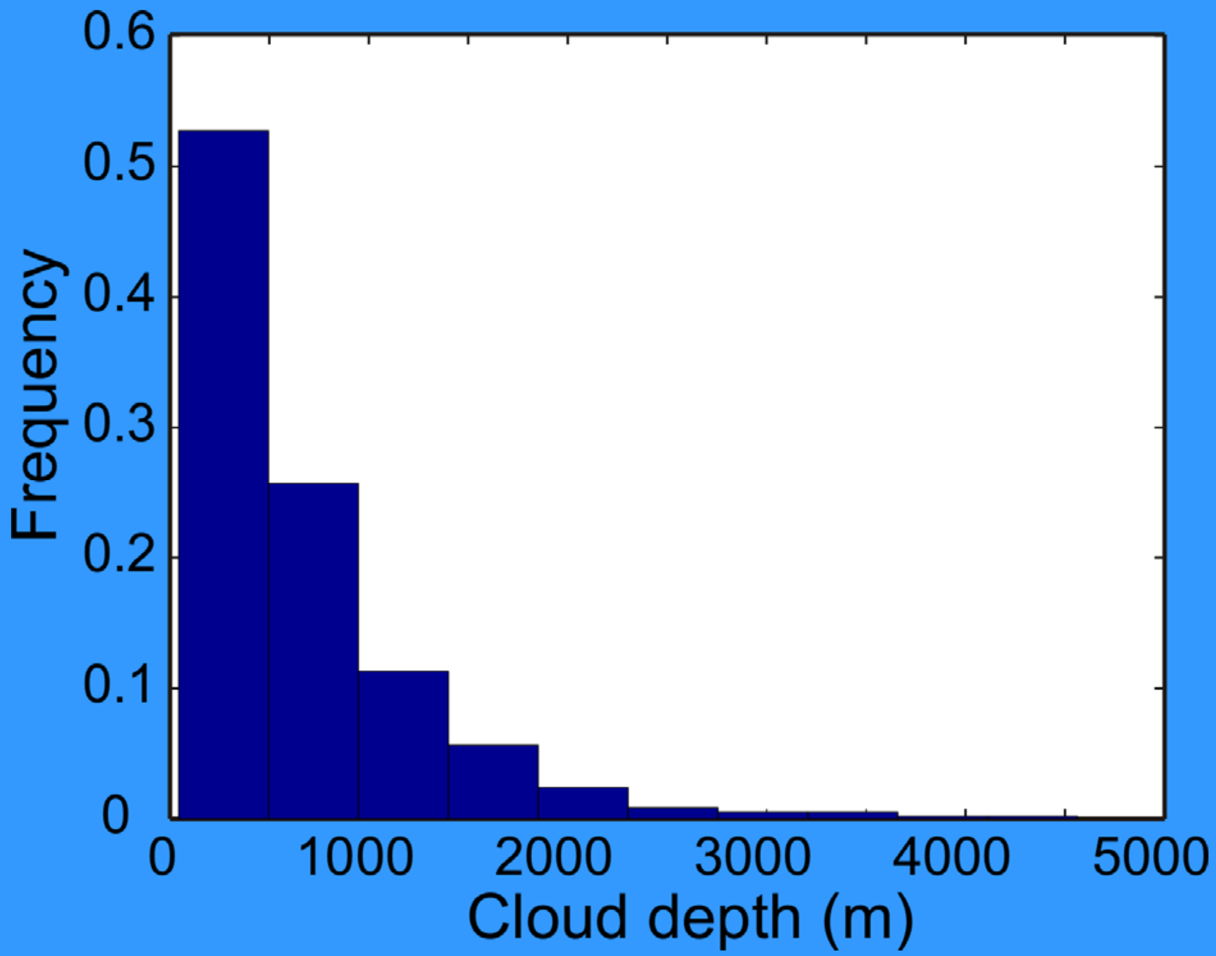
Frequency distribution of $H_{50\%}$



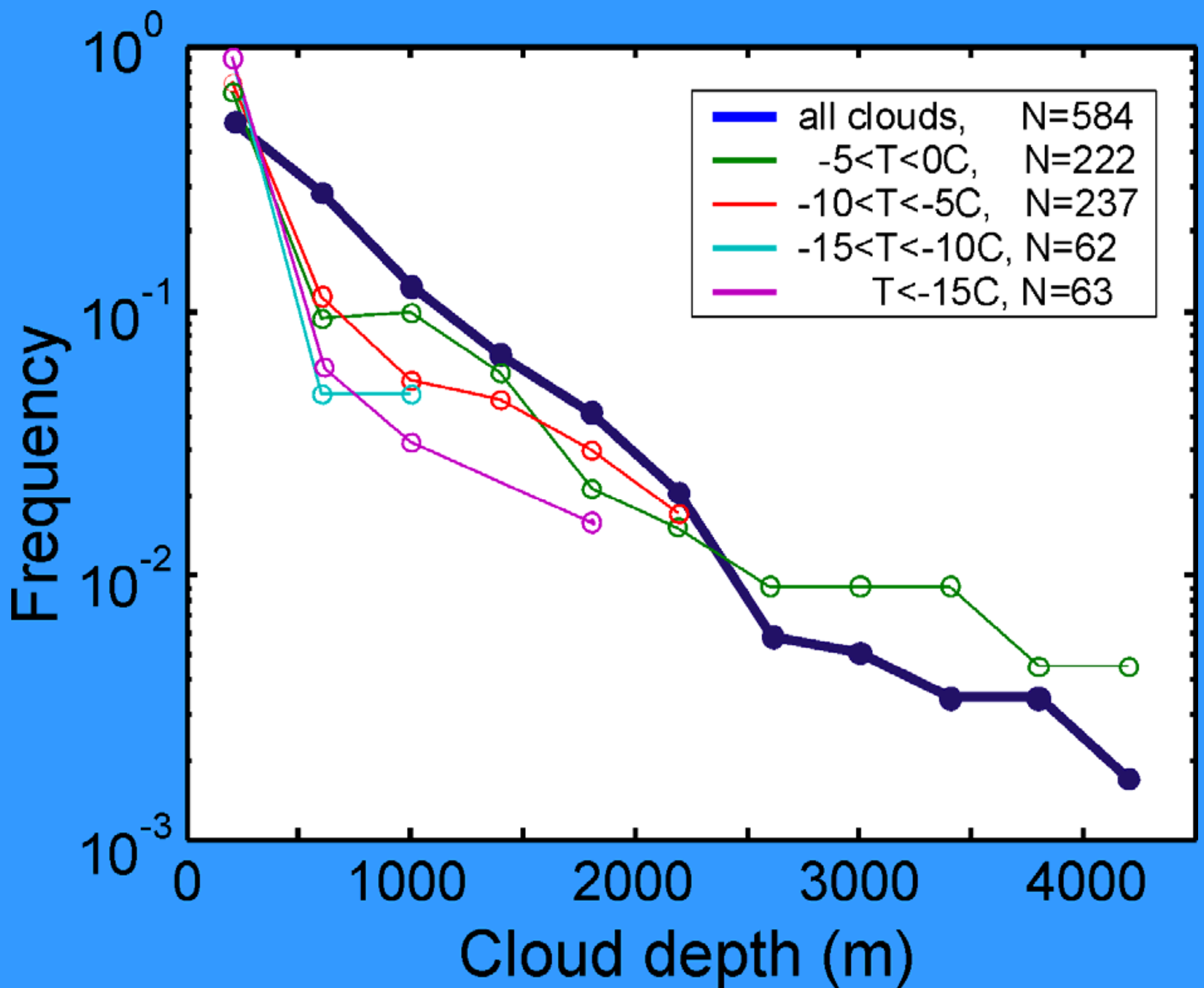
Normalized LWC profile for cloud layers with different depth



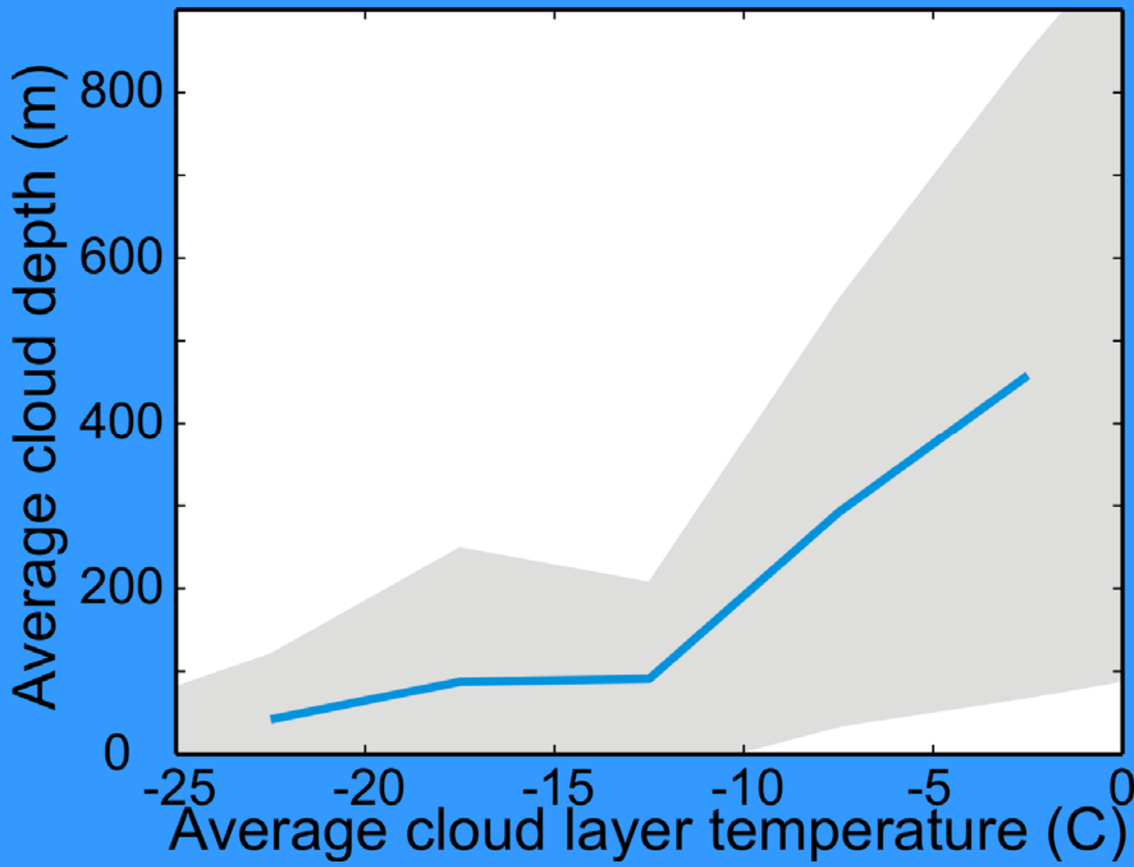
Frequency of occurrence of liquid cloud depth



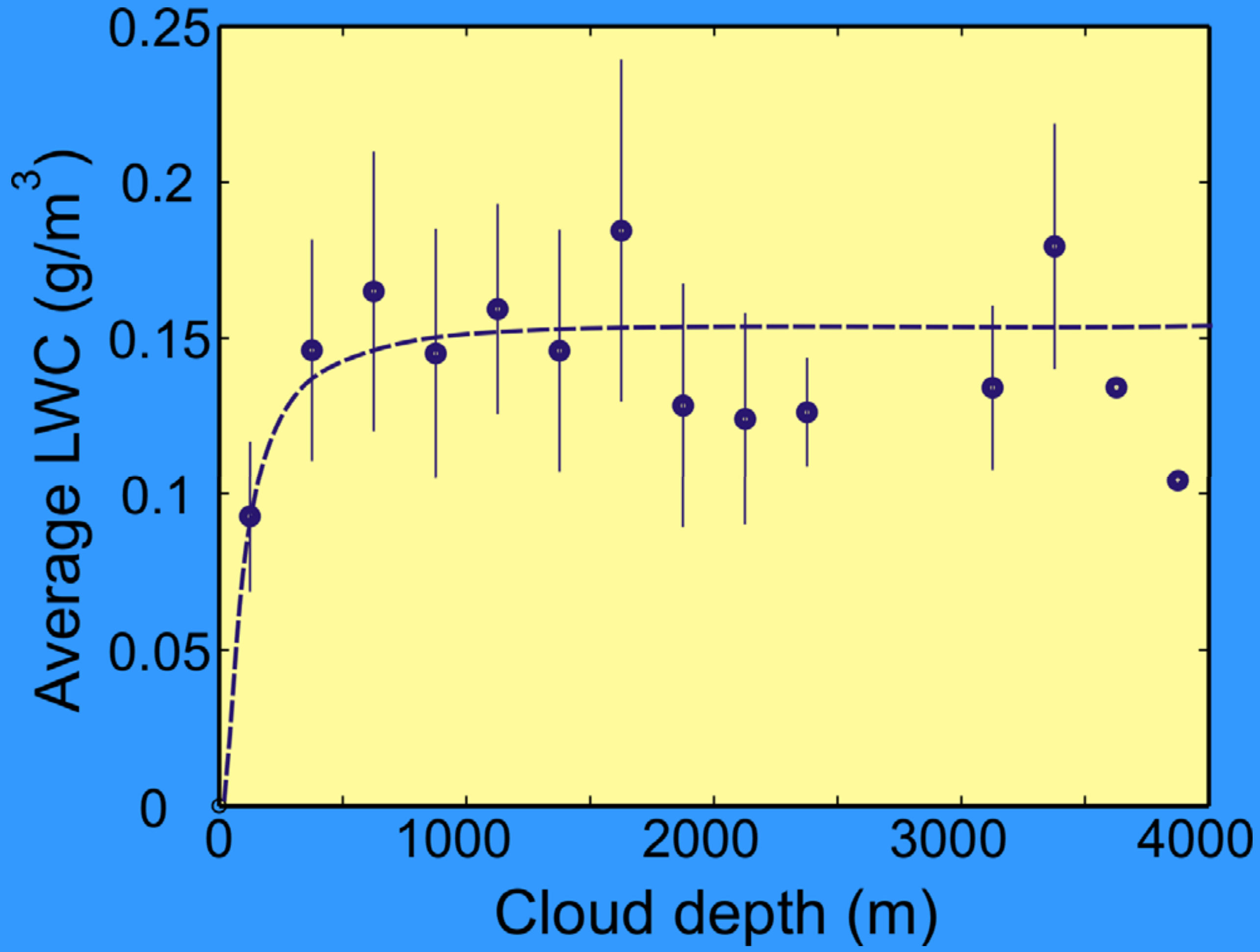
Frequency of occurrence of liquid cloud depth in different temperature intervals



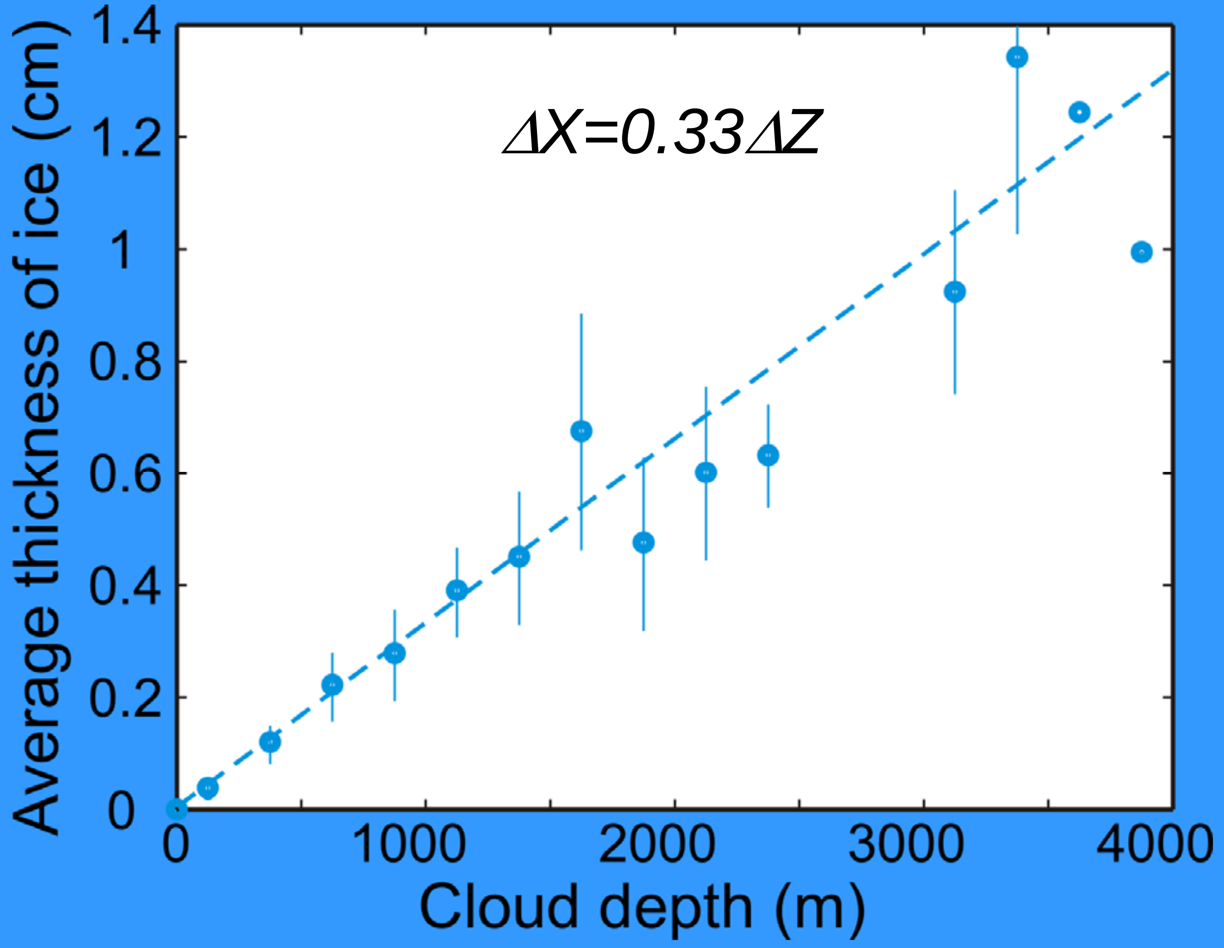
Average liquid layer depth vs. average temperature of the layer



Vertical average LWC versus cloud depth



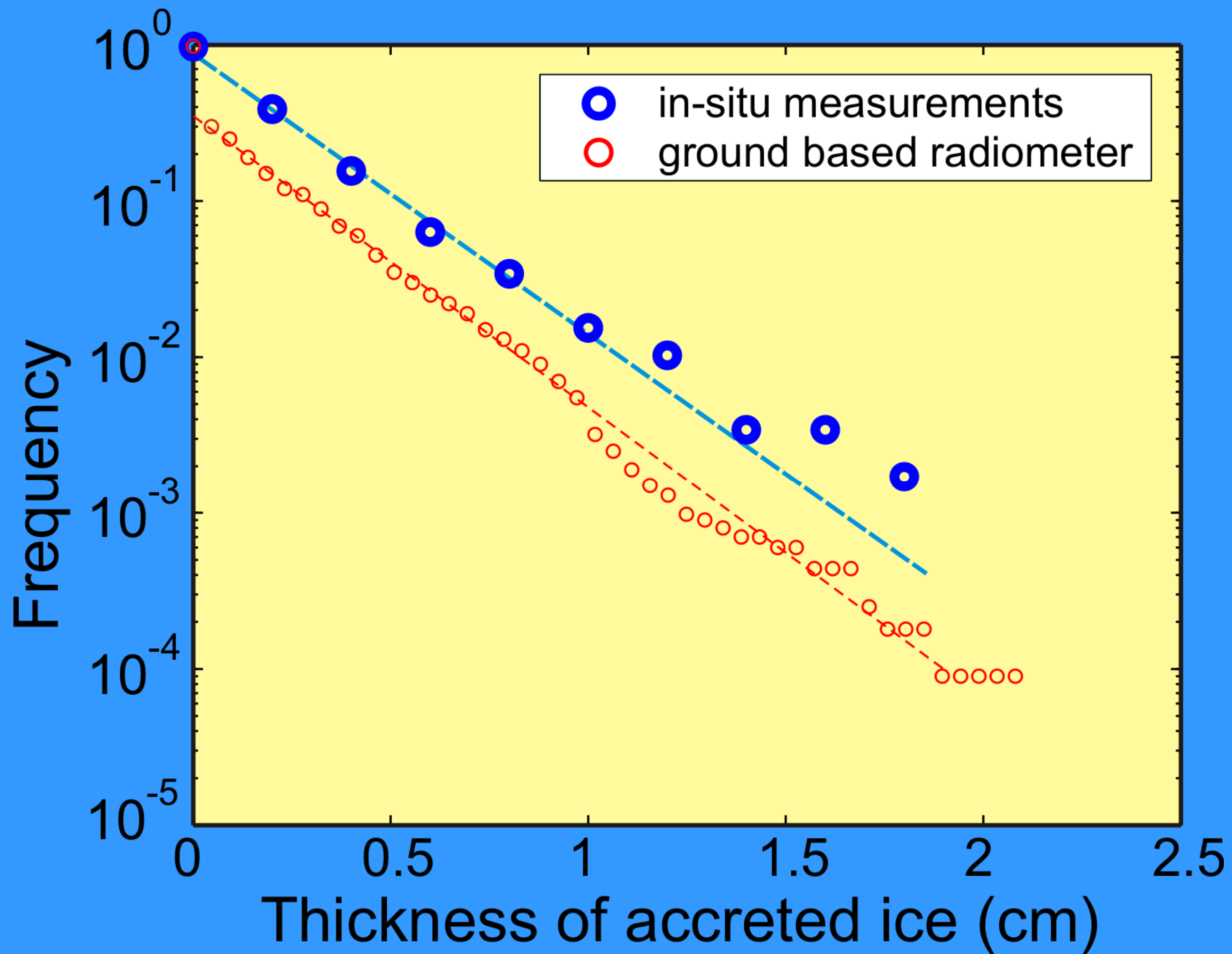
Parameterization of the thickness of accreted ice versus the depth of supercooled stratiform layers in frontal clouds for a 3 degree glide slope

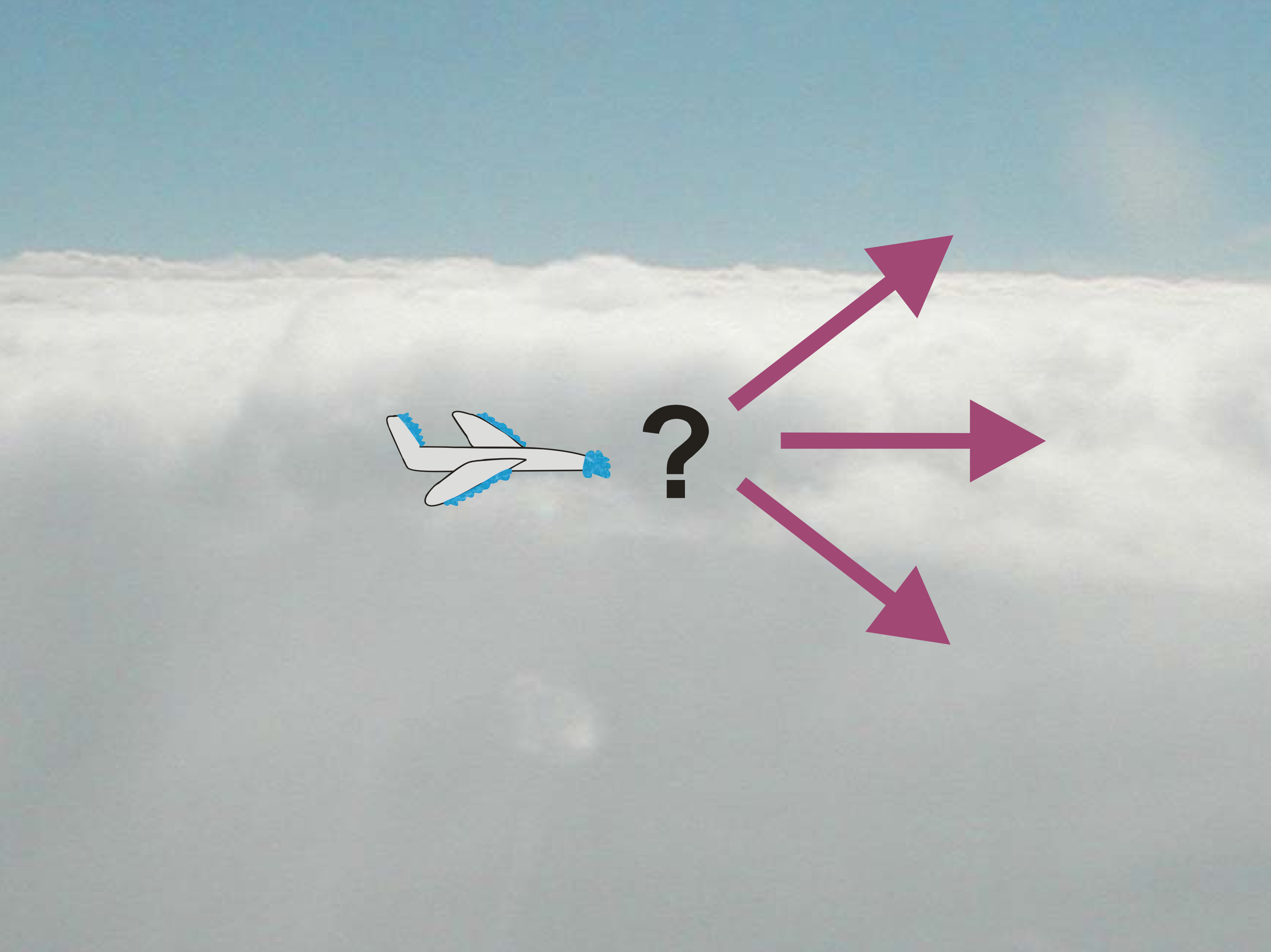


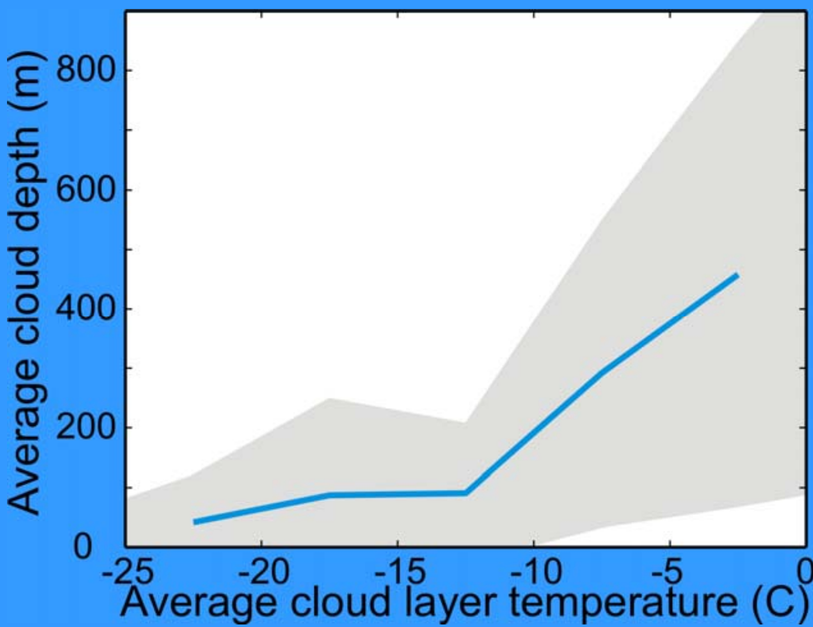
ΔX thickness of ice (cm)

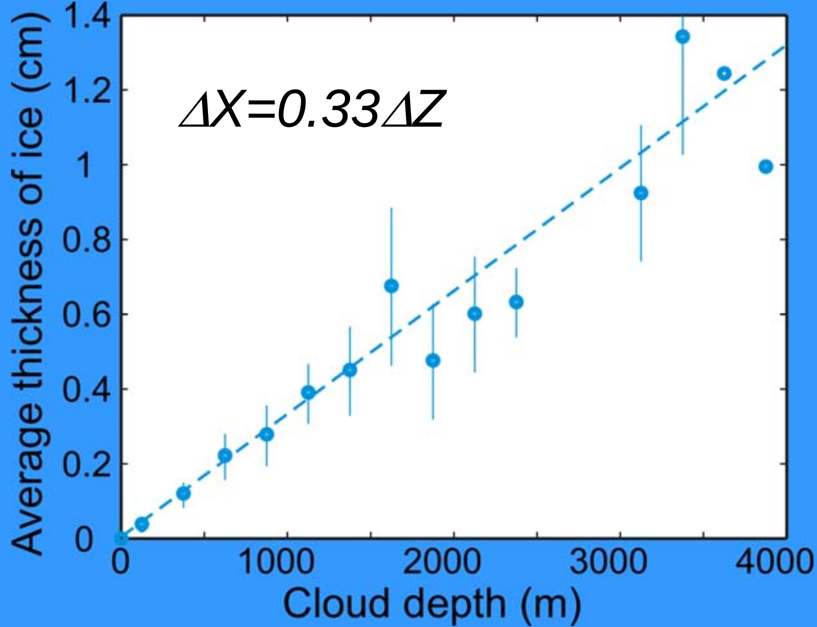
ΔZ cloud depth (m)

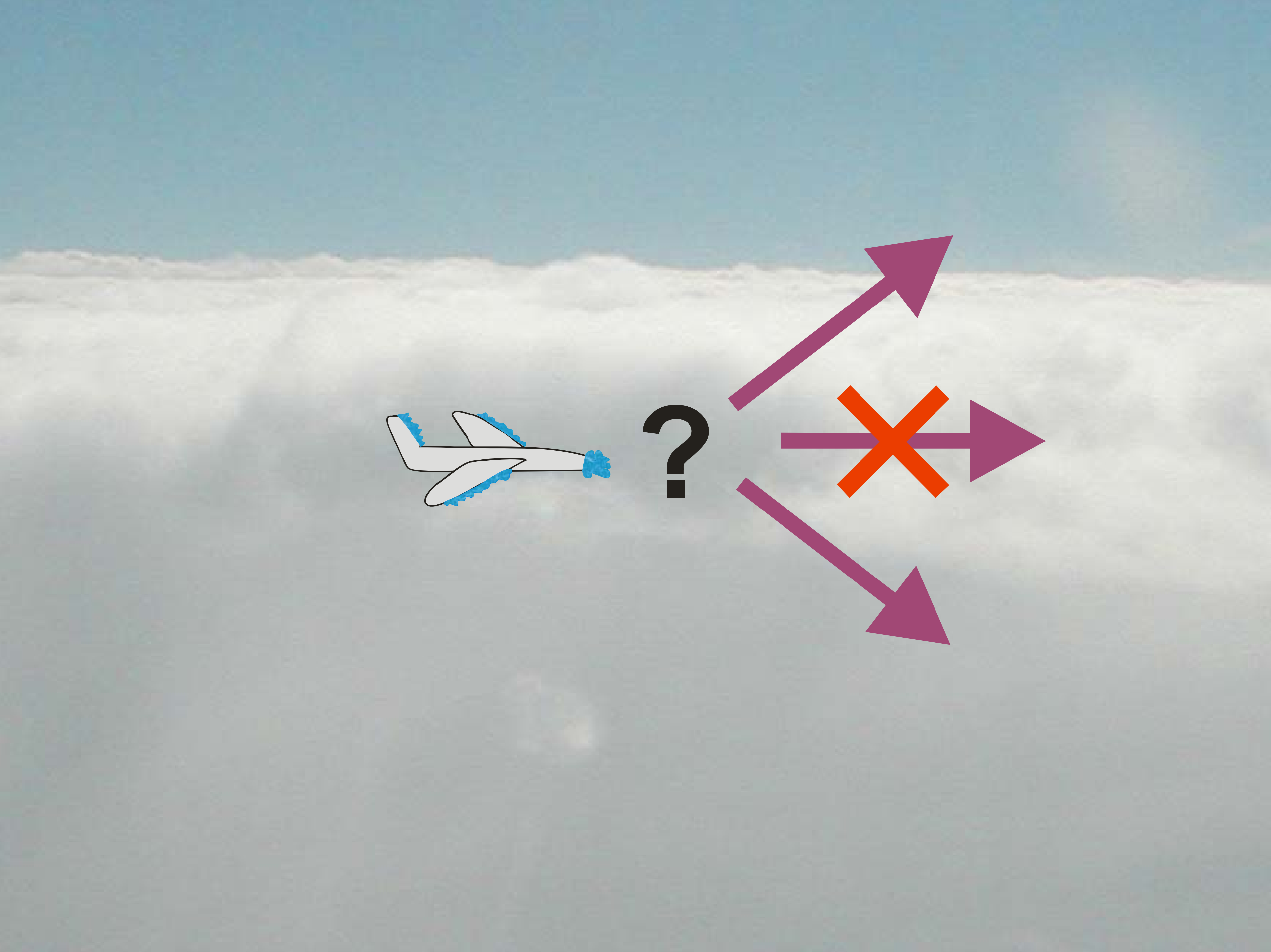
Thickness of accreted ice for a 3 degree glide slope






Average cloud depth (m)
800
600
400
200
0
-25
-20
-15
-10
-5
0
Average cloud layer temperature (C)


Average thickness of ice (cm)
1.4
1.2
1
0.8
0.6
0.4
0.2
0
ΔX=0.33ΔZ
0
1000
2000
3000
4000
Cloud depth (m)



CONCLUSIONS

1. Based on the analysis of 584 supercooled cloud layers, statistics of the cloud depth, LWC, and potential thickness of accreted ice were obtained. These results are important for estimation of the potential consequences of in-flight icing that an aircraft may experience during climb or descent.

2. If an aircraft encounters significant icing, an appropriate escape strategy would be to continually climb or descend in order to minimize the amount of accreted ice. In such a scenario, the amount of accreted ice would not likely exceed 2 cm.

3. It is recommended that microwave radiometers be used at airports to remotely sense liquid water paths and estimate potential in-flight icing. Such radiometers would be a valuable addition to any airport nowcasting system for winter weather.

Acknowledge funding support from Transport Canada