Observations météorologiques et nivologiques à dôme C:

de l'existant

et

de l'héritage de CONCORDIASI

Laboratoire de Glaciologie et Géophysique de l'Environnement

INSU Observer & comprendre

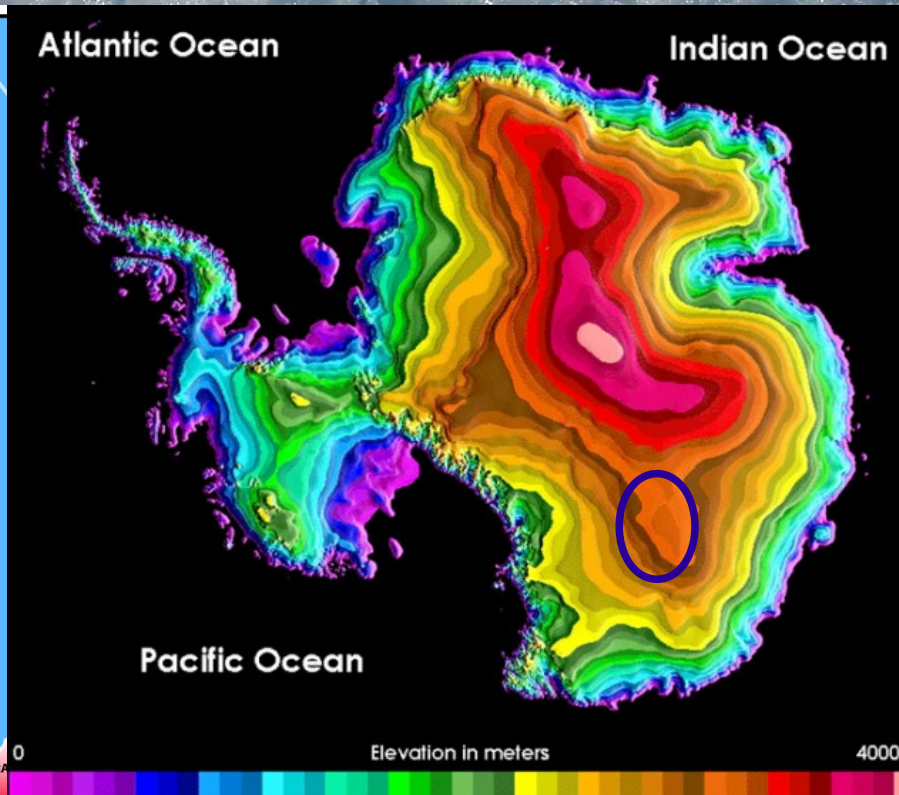
OSUG Observatoire des Sciences de l'Univers de Grenoble

IPEV Institut Polaire Français Paul Emile Victor

Dome C, Antarctica

- On the high antarctic plateau: 75°06.06S, 123°20.74E, 3350 m asl

- >1000 km inland from the nearest coast

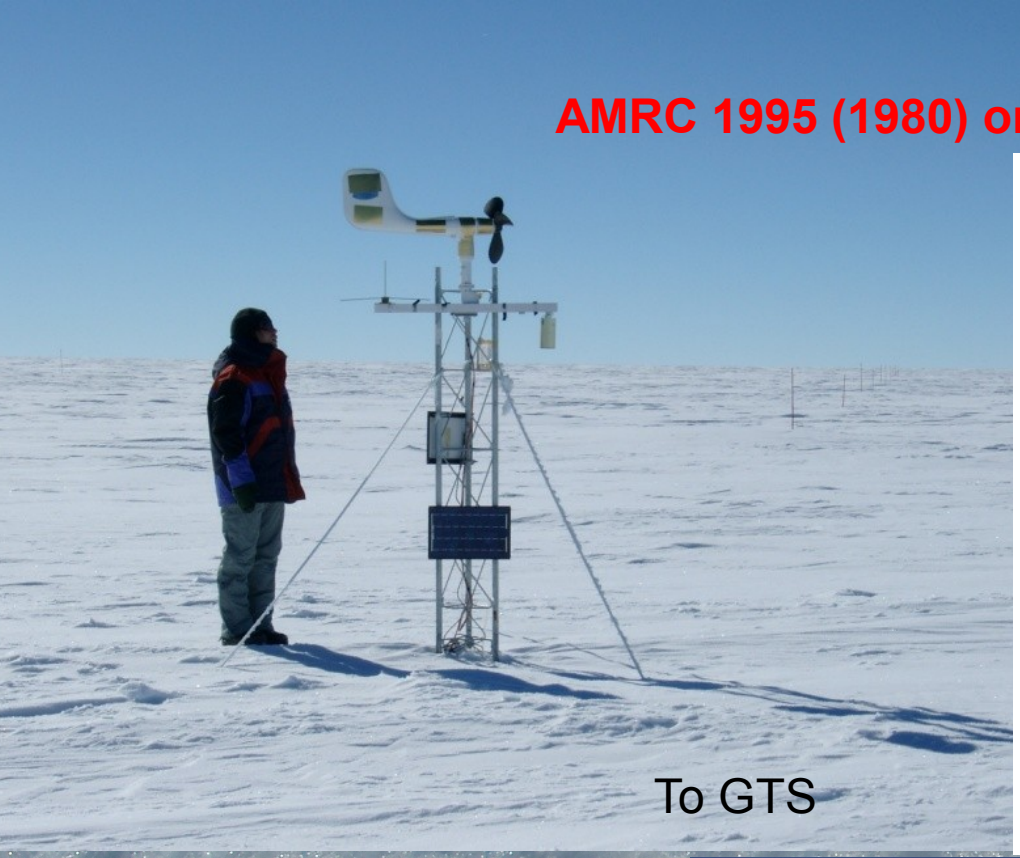


Dôme C, morne plaine...

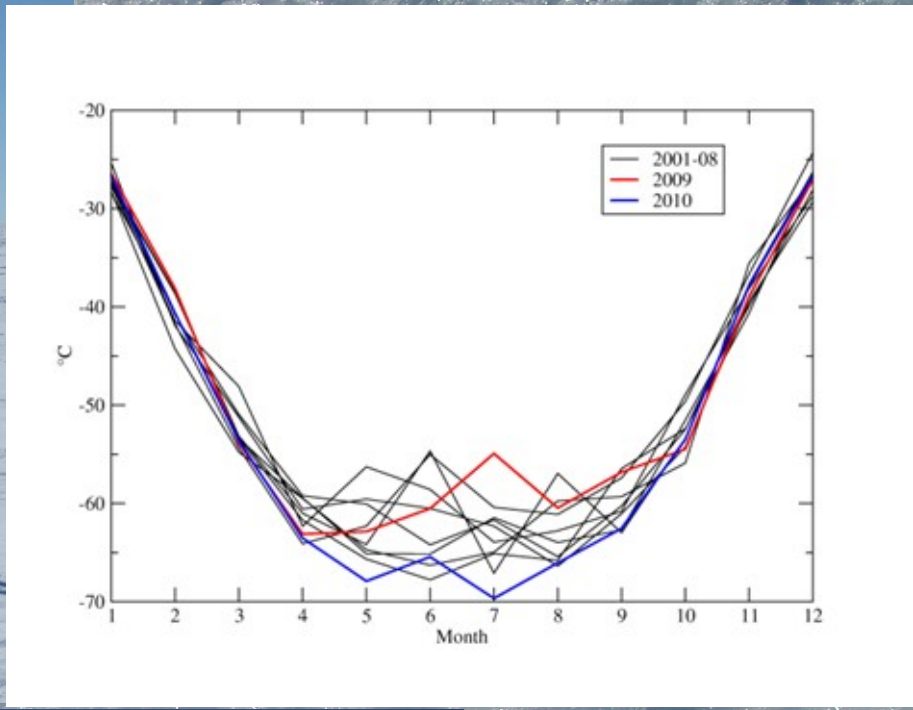
Dome C, Antarctica

A permanent station: Concordia (Fr/It)

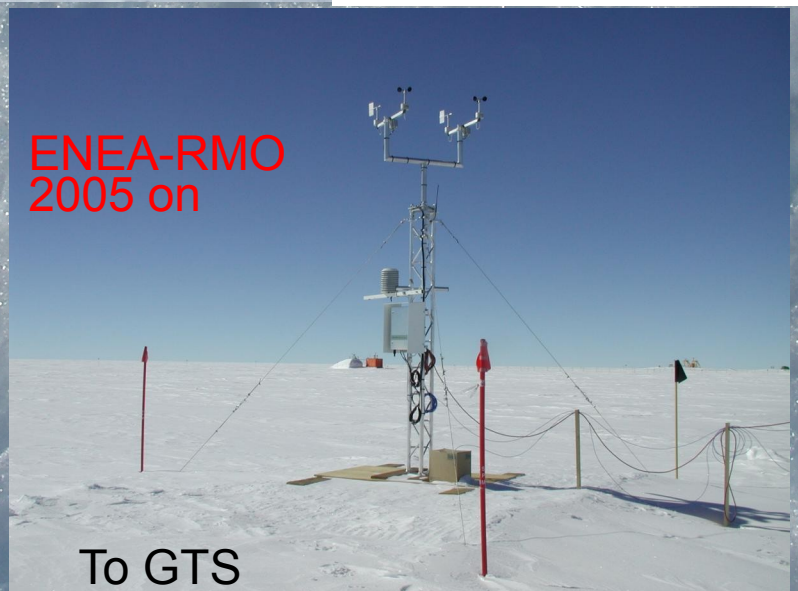
AMRC 1995 (1980) on



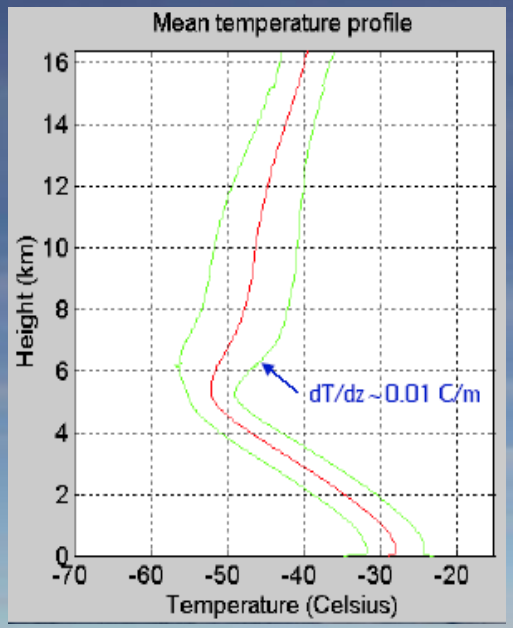
To GTS



ENEA-RMO
2005 on



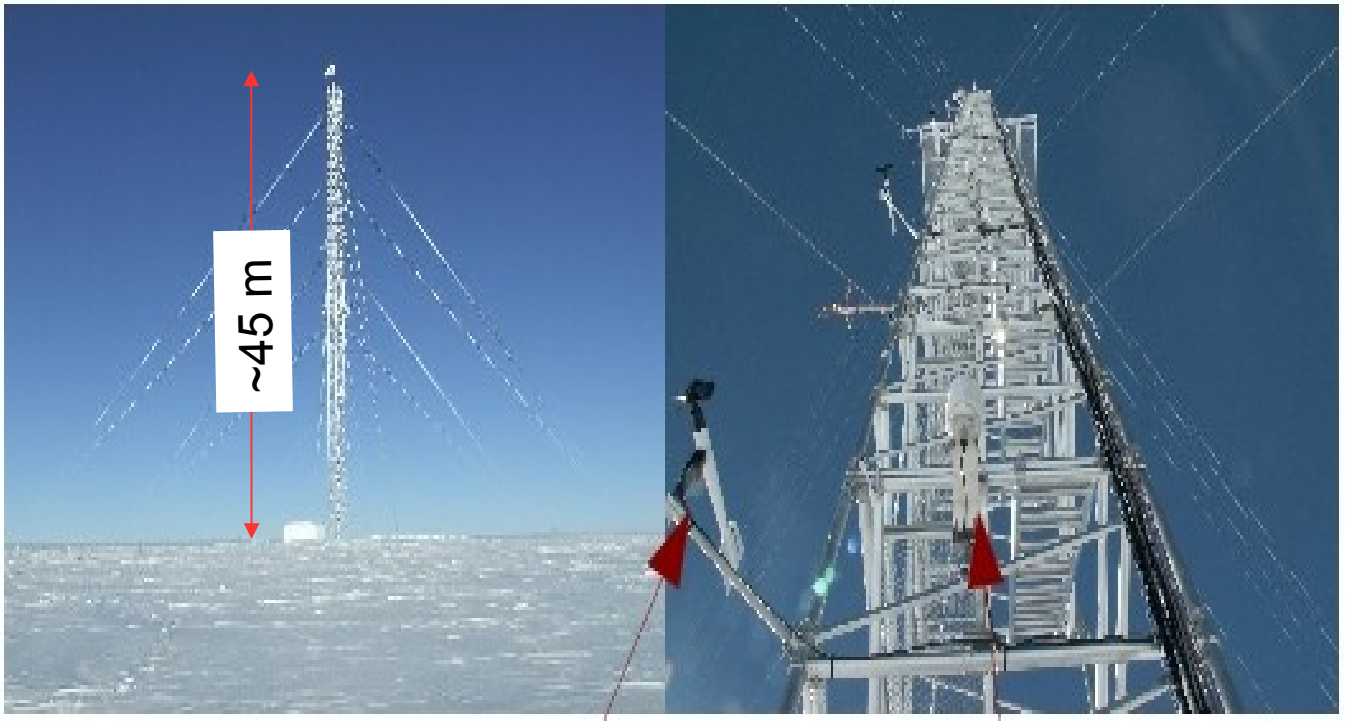
To GTS



Daily RS (12:00 UT, 20:00 local)

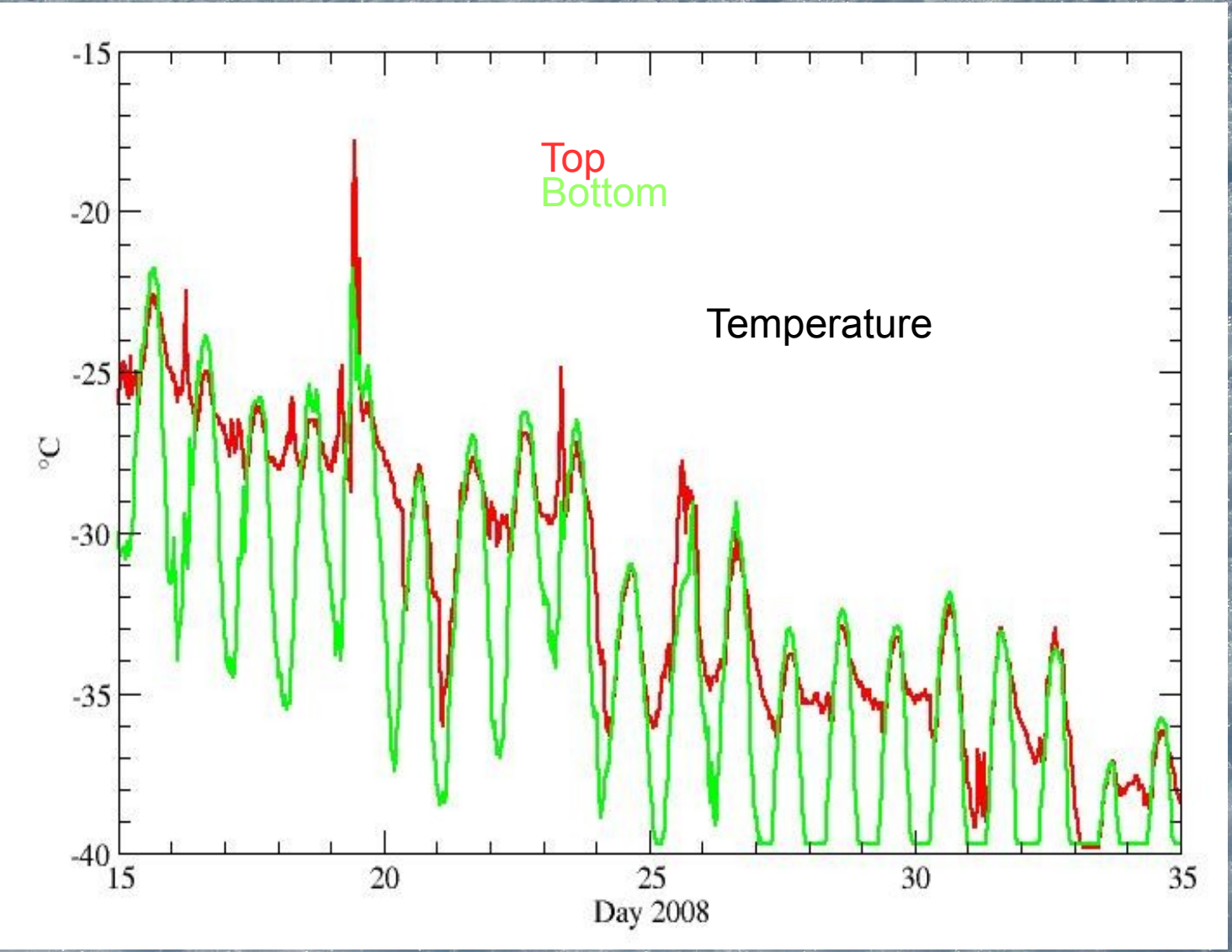
Additional RS during SOPs, e.g CONCORDIASI

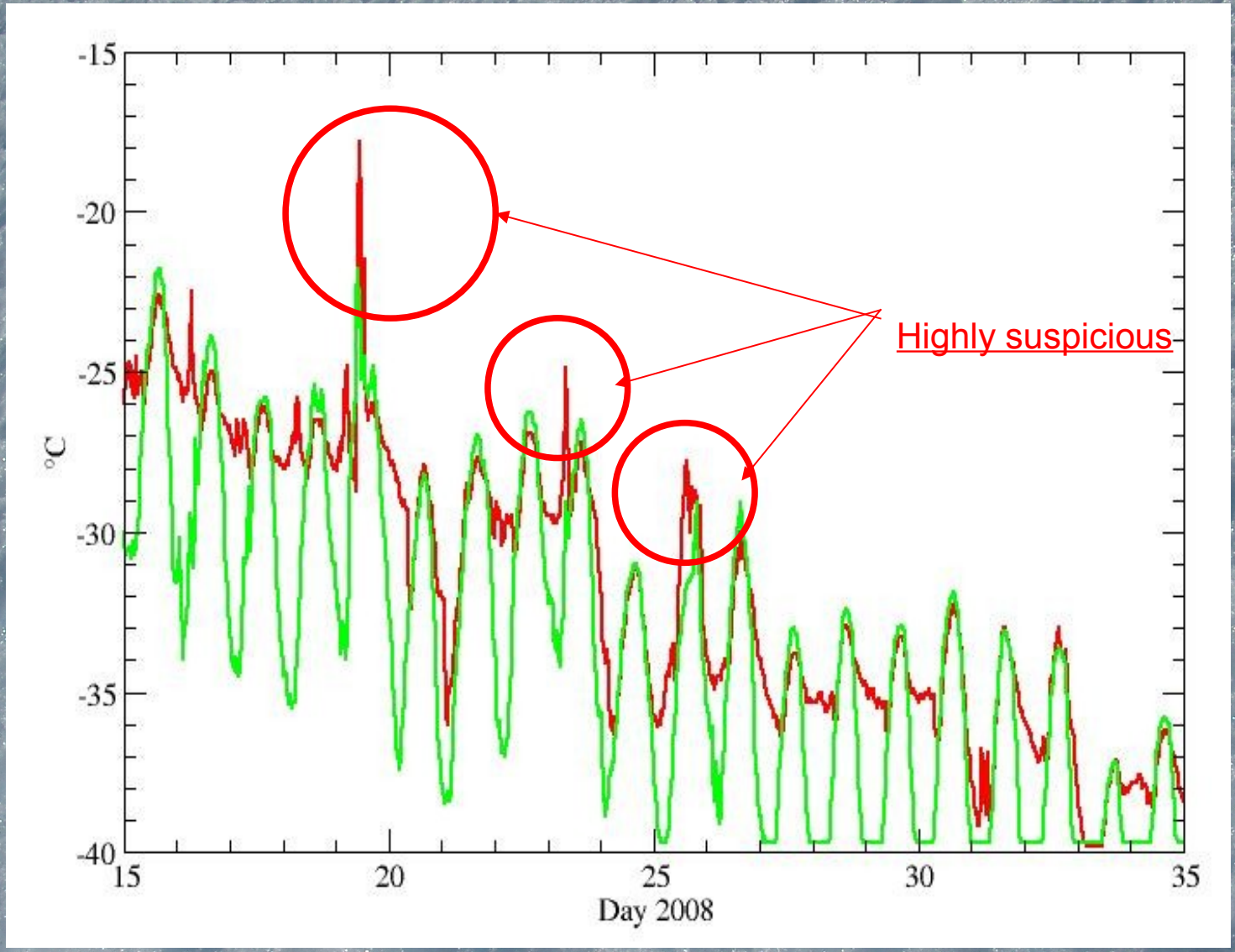
To GTS



A continuous surface atmospheric boundary layer profiling system, ~3 to ~44 m above surface, since January 2008

=> programme IPEV CONCORDIASI (+ radiosondages)


Top
Bottom
Temperature
°C
-15
-20
-25
-30
-35
-40
15
20
25
30
35
Day 2008



Atmospheric temperature measurement is an issue on the antarctic plateau

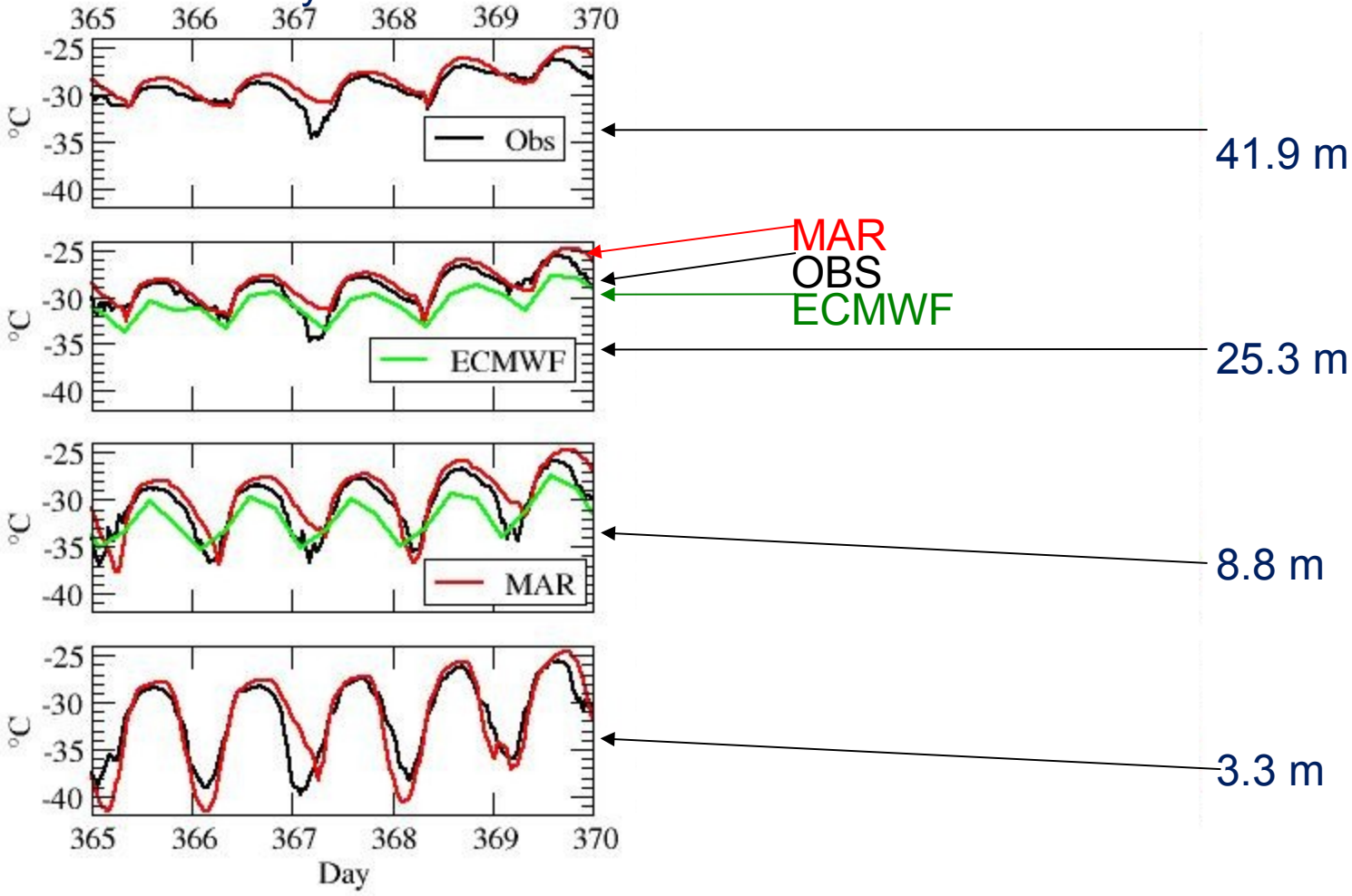
2009 on: Aspirated (RM Young 43502)

Dispo en 2009 pour la campagne CONCORDIASI

2008: gill-style multiplate natural (wind) ventilation

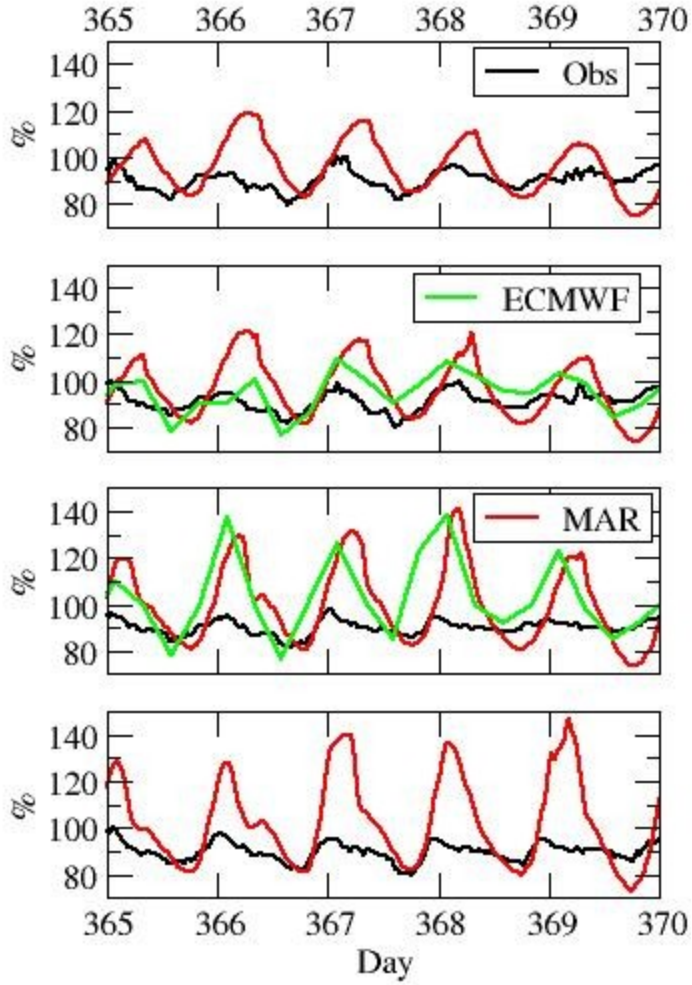
Observation + ECMWF analyses + MAR mesoscale model

A few days in summer



Temperature

Observation + ECMWF analyses + MAR mesoscale model



41.9 m

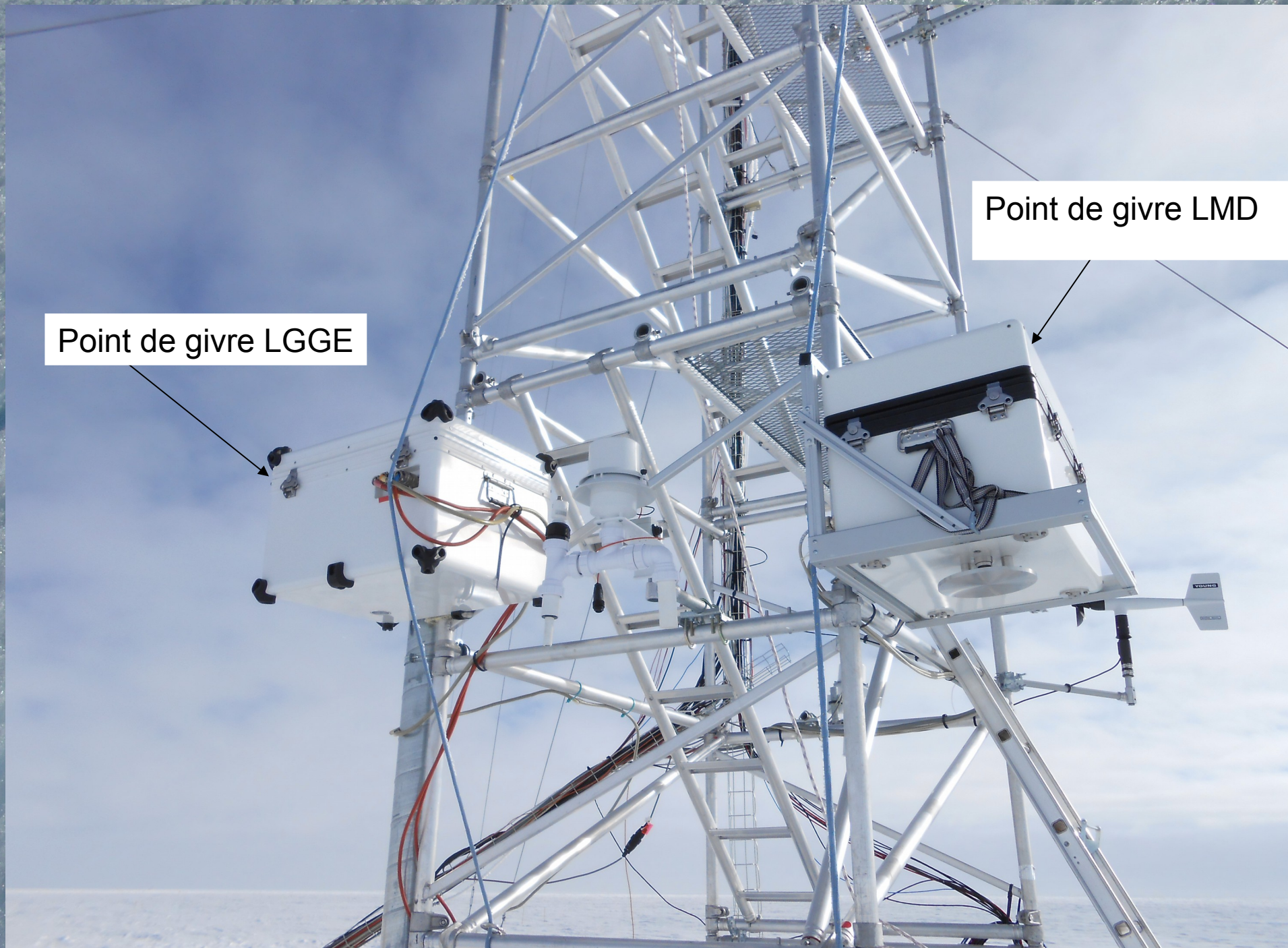
25.3 m

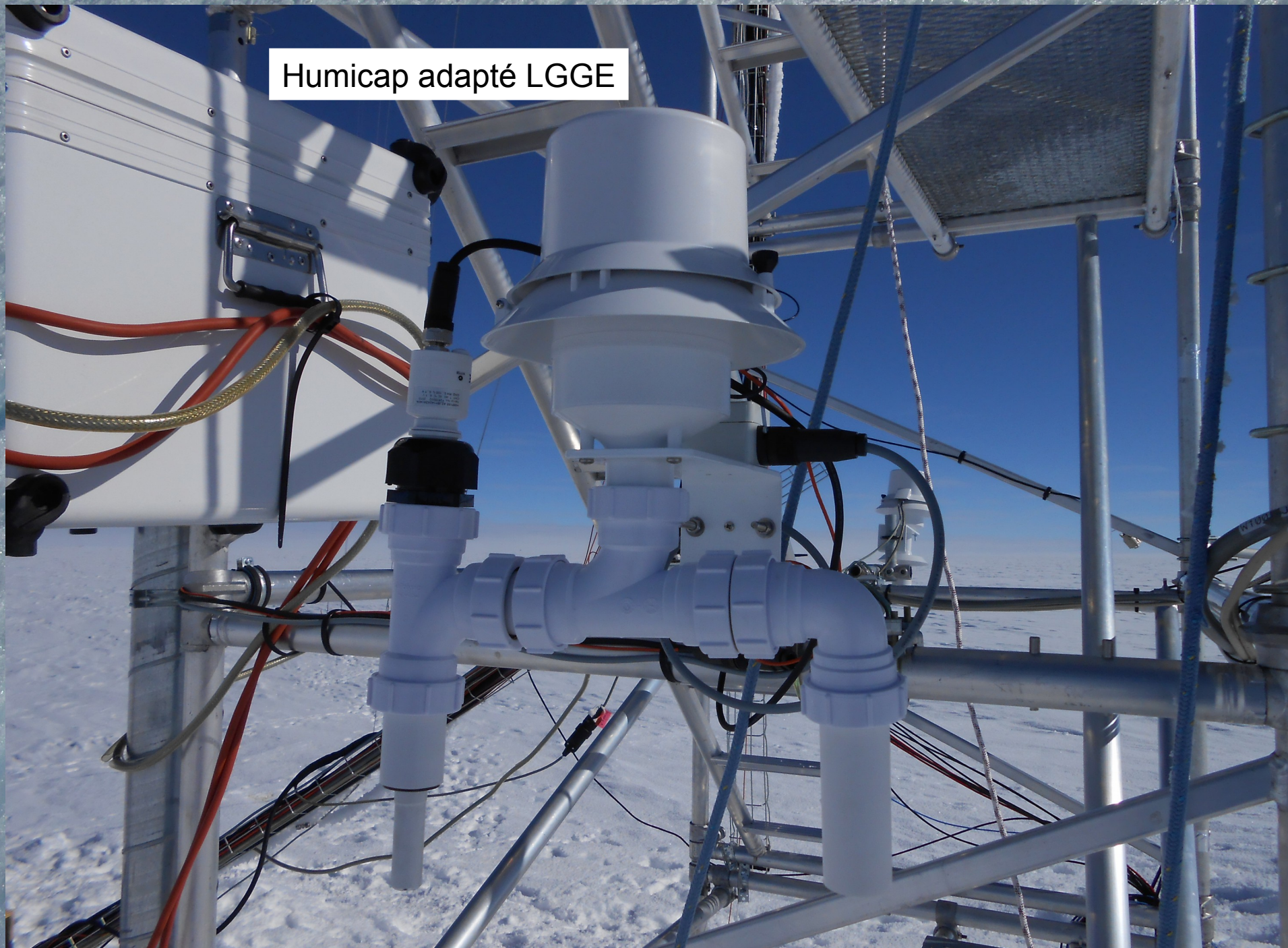
8.8 m

3.3 m

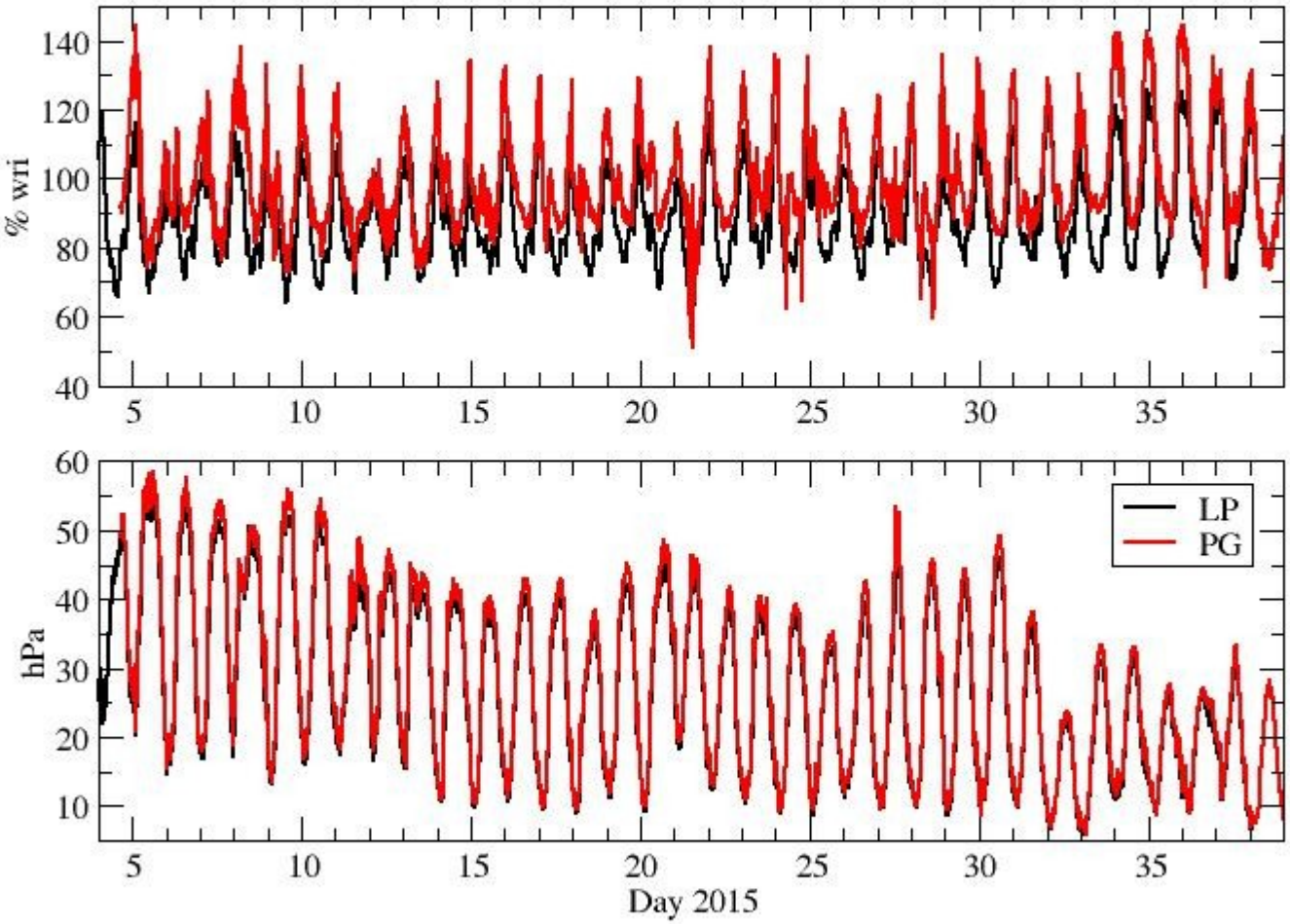
Relative humidity wrt ice

Elément de mesure (Humicap)


Point de givre LMD
Point de givre LGGE

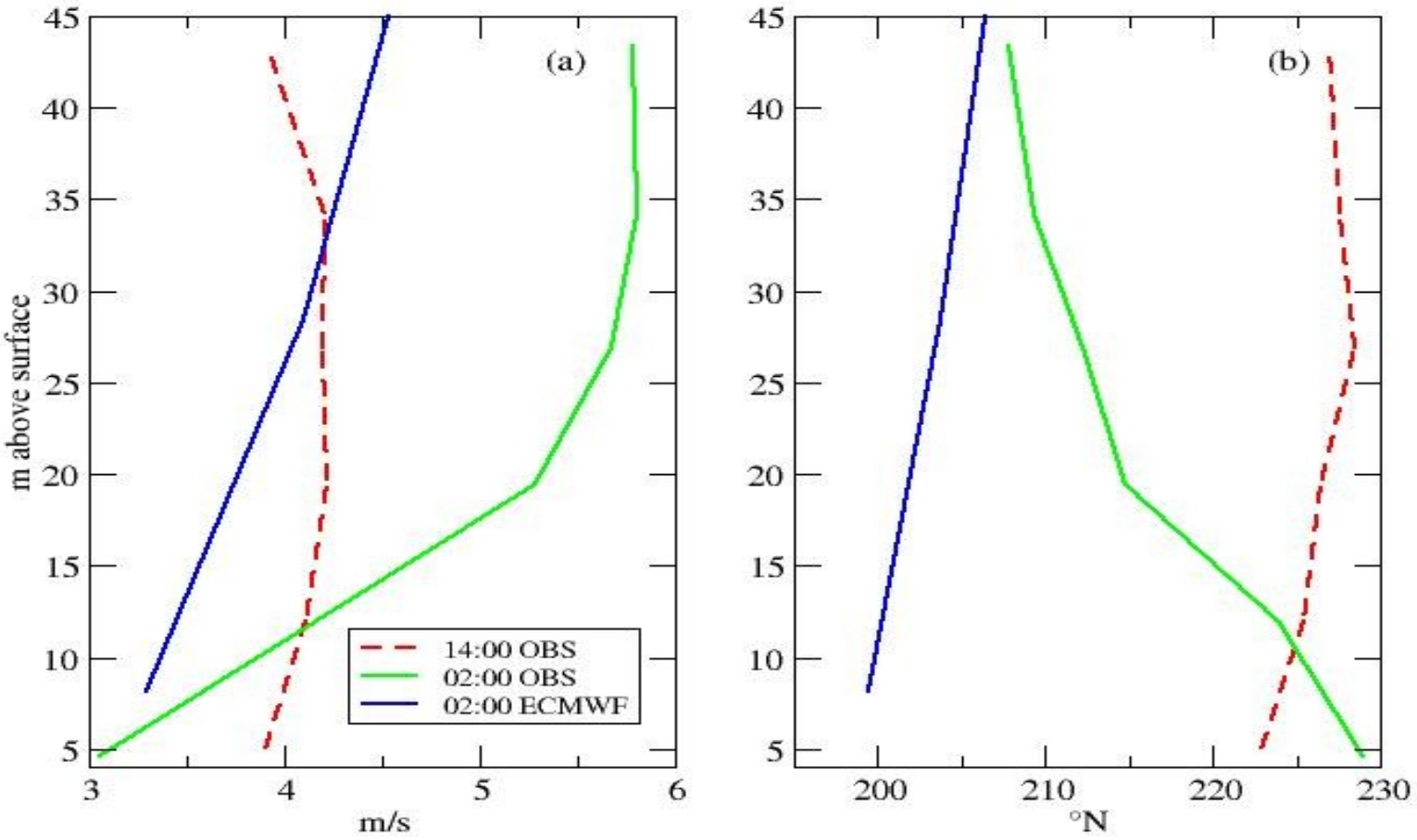

Humicap adapté LGGE

Ca marche ! => tests des paramétrisations de microphysique froide (J.-B. Madeleine, LMD)

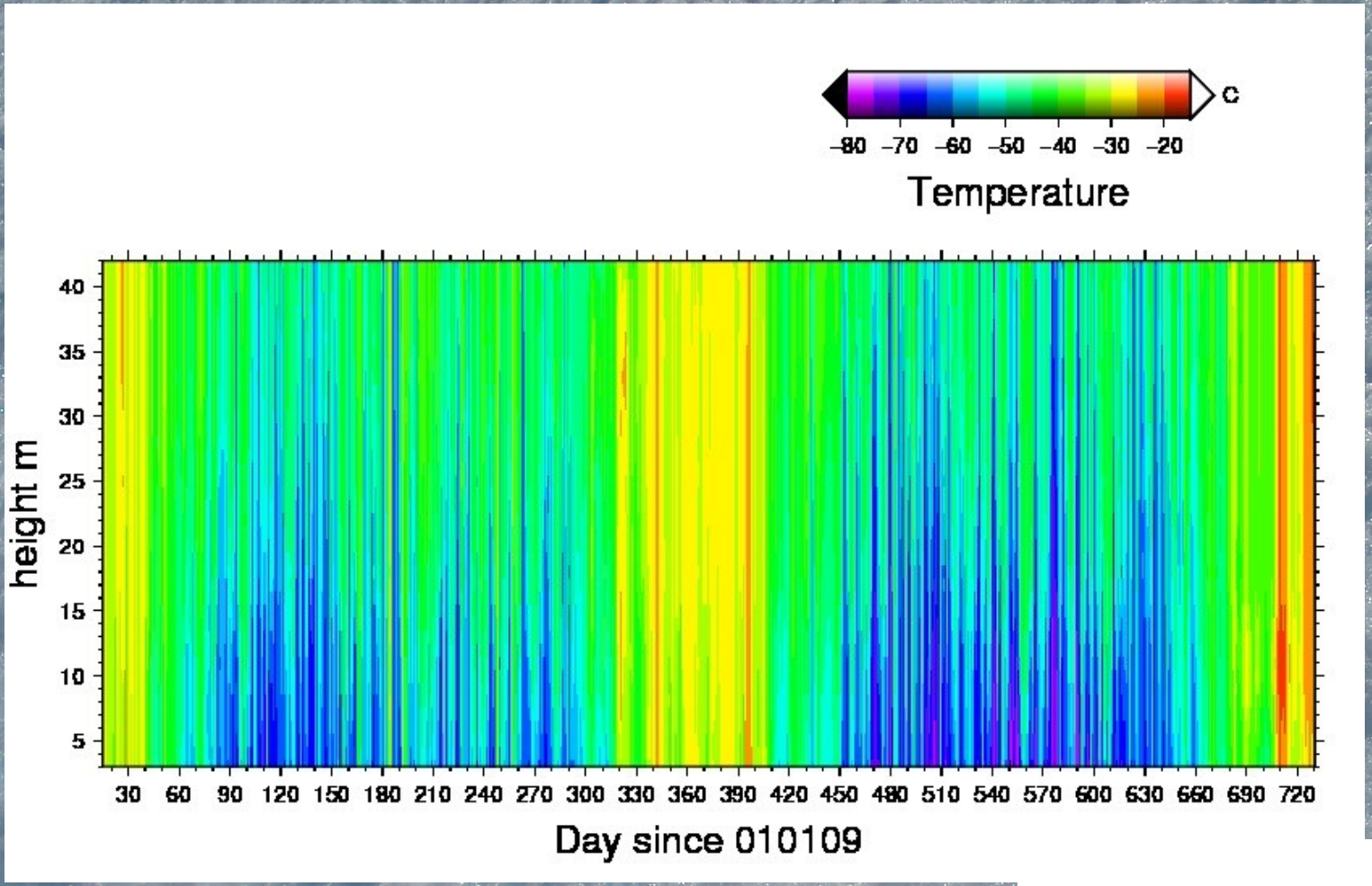


Mais la mesure à Dôme C
c'est en général pas facile...

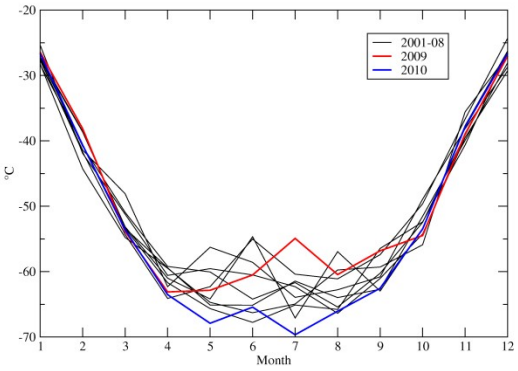
En particulier pour les thermo-anémomètres soniques Olivier ?



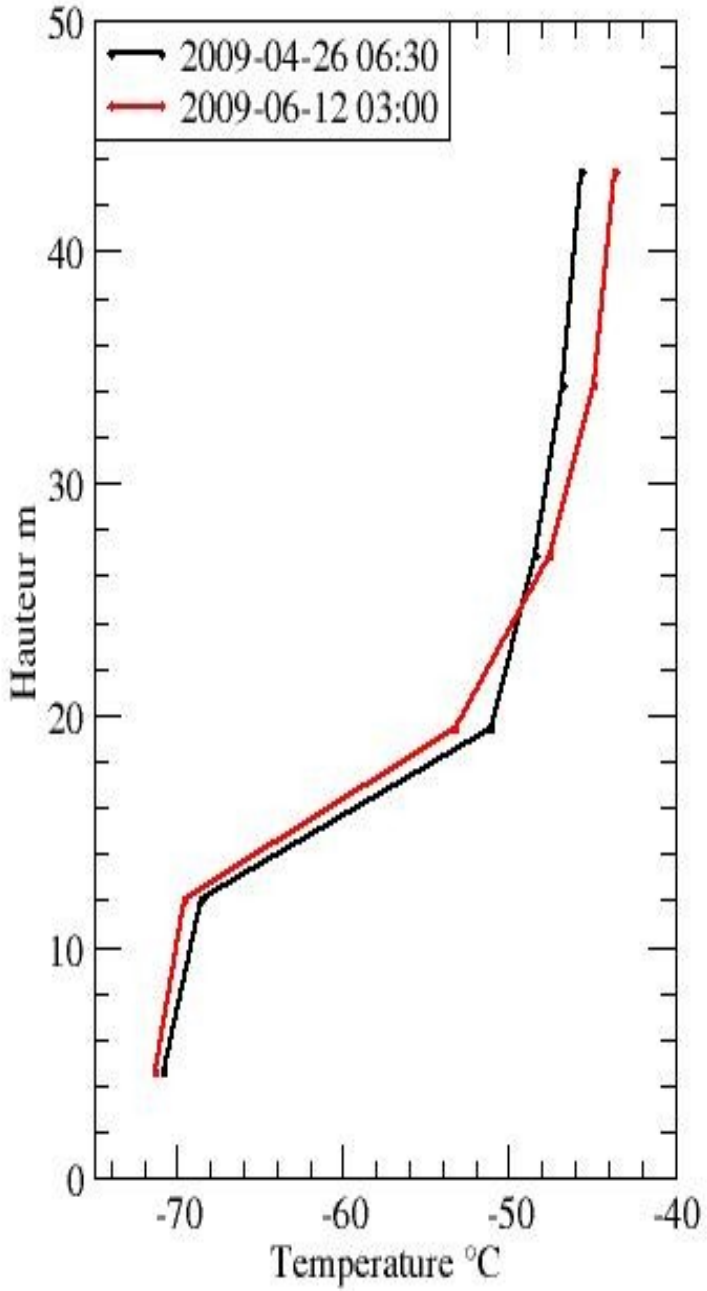
Observed (tower) and analyzed (ECMWF) mean wind profile, January 2008 (avec Mike Town...)

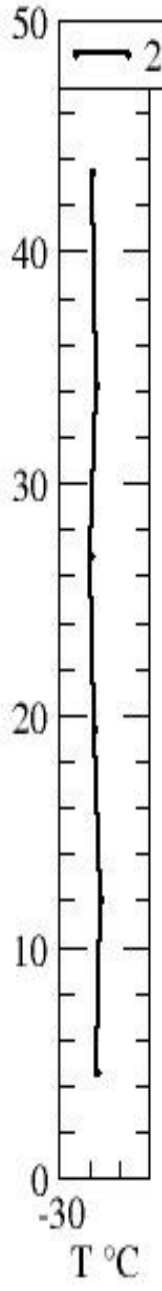


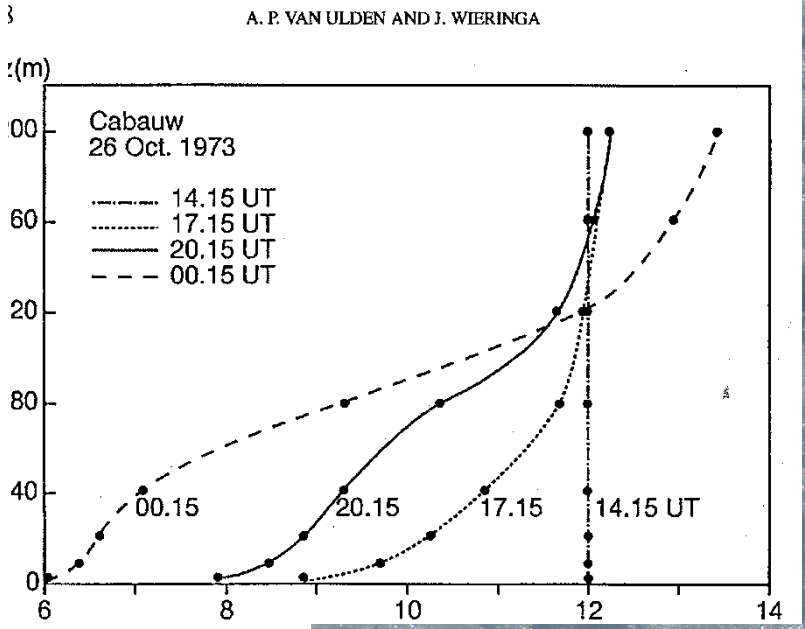
Temperature 2009-2010



AMRC AWS
2001-2010







Cabaw, Oct 1973

Dome C est labélisé “core observation site” du Global Cryospheric Watch (OMM)
http://globalcryospherewatch.org/cryonet/sitepage.php?surveyid=64

Activités Firefox ven. 8 mai, 19:47 fr

Global Cryosphere Watch – Site Information – Mozilla Firefox

Global Cryosphere W...

globalcryospherewatch.org/cryonet/sitepage.php?surveyid=64

gcw cryonet dome c

World Meteorological Organization

Global Cryosphere Watch

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Dome-C Site Information

Concordia is a joint French-Italian research facility opened in 2005 on the Antarctic Plateau, Antarctica (75°6 0 S, 123°20 0 E), managed together by PNRA (Italian National Antarctic Programme) and IPEV (Institut Polaire Français Paul Émile Victor).

It is built at 3,233 m above sea level on the third highest summit of Antarctica: Dome C.

Although the summit of a local dome, the surface is essentially flat:surface elevation above sea-level varies by only a few meters over horizontal distances of tens of km. Snow fall and accumulation are very small (about 10 cm of snow accumulation per year) The surface is consistently snow covered because the temperature is always way below freezing all year long and melting does not occur. Temperatures hardly rise above -25°C in summer and can fall below -80°C in winter. The annual average air temperature is -54.5°C. Humidity is low and it is also very dry, with very little precipitation throughout the year.

The station is permanently staffed with at least 10 people in the winter (about half of whom with scientific observation duties) and more than 70 during the local summer. This allows a large range of observation and scientific experiments, including in the field of meteorology, glaciology, snow science, sismology, geomagnetism astronomy and astrophysics, and medical sciences. Operational meteorological observations are carries out, including one radiosounding per day at 12:00 TU, and transmitted on the GTS. The horizontal homogeneity and latitude of Dome C make it an ideal site for the calibration and validation of data from satellites on polar orbit.

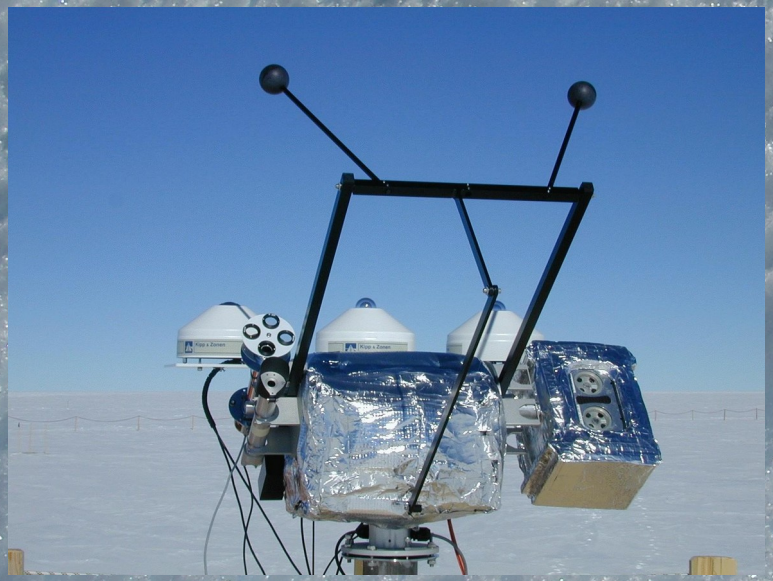
Other Networks to Which This Site Belongs

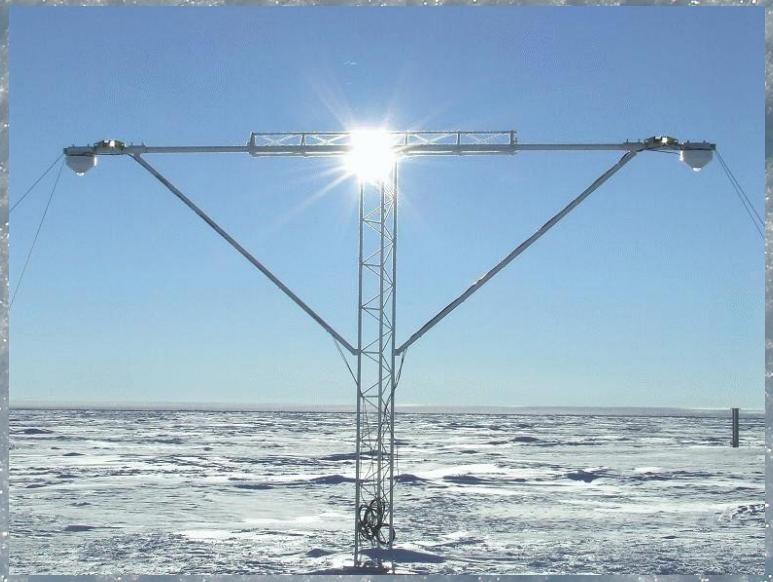
Metadata

» GCW site type: Core
» CryoNet site type: Basic
» WMO ID (if any): NA
» Latitude, longitude: -75.1, 123.33
» Altitude min, max (m): 3230,
» Landscape: Antarctic Ice sheet
» Year established: 2004
» Year-round? Yes
» Operations contact: Pascal Morin
» Science contact: Giovanni Macelloni
» Data contact: Christophe Genthon
» Website: http://www.ipev.fr; www.pnra.it

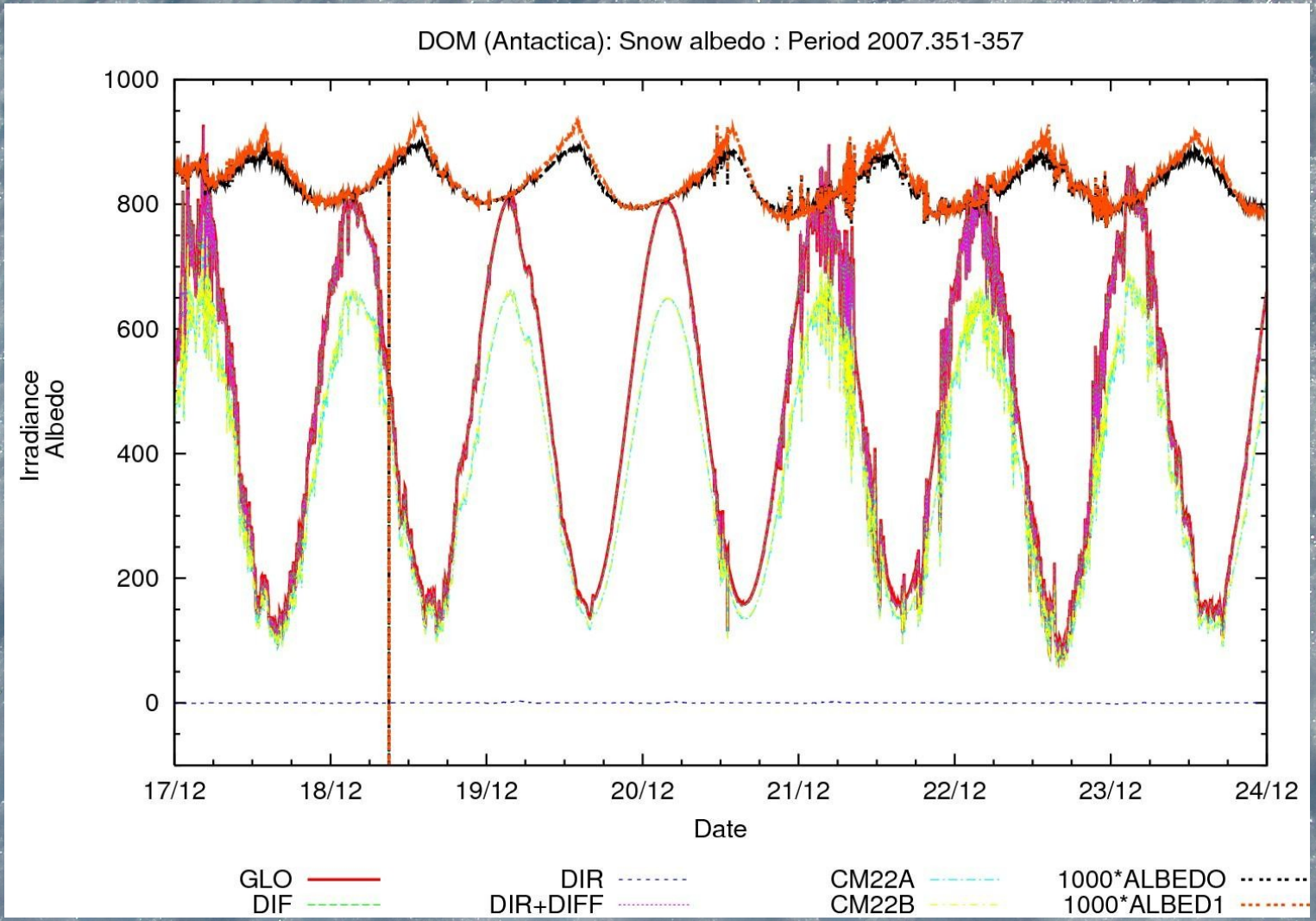
Baseline Surface Radiation Network station at Dome C

Operated by ISAC, NRC, Bologna





Busetto, Lanconelli, et al. :
http://www.cnrm.meteo.fr/concordiasi/IMG/pdf_7-1_busetto_bsrn_toulouse.pdf



Fortes inversions
+ Convection (cycle diurne)
+ Homogénéïté spatiale
+ Observations

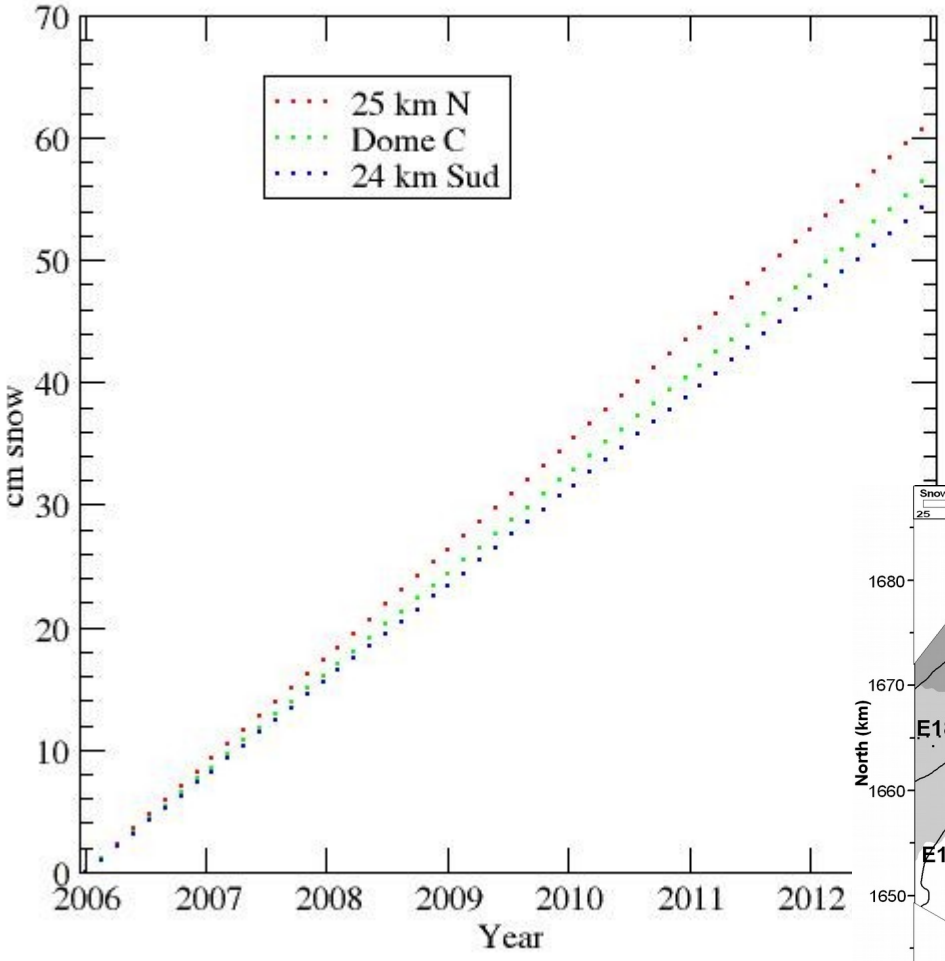
=> GABLS4 (Fleur)

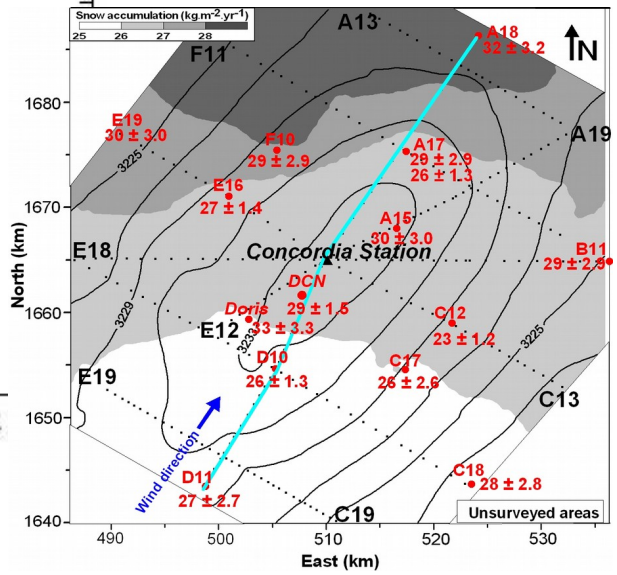
Dôme C, morne plaine … plate :

Sur 50 km, l'altitude change de moins de 10 m

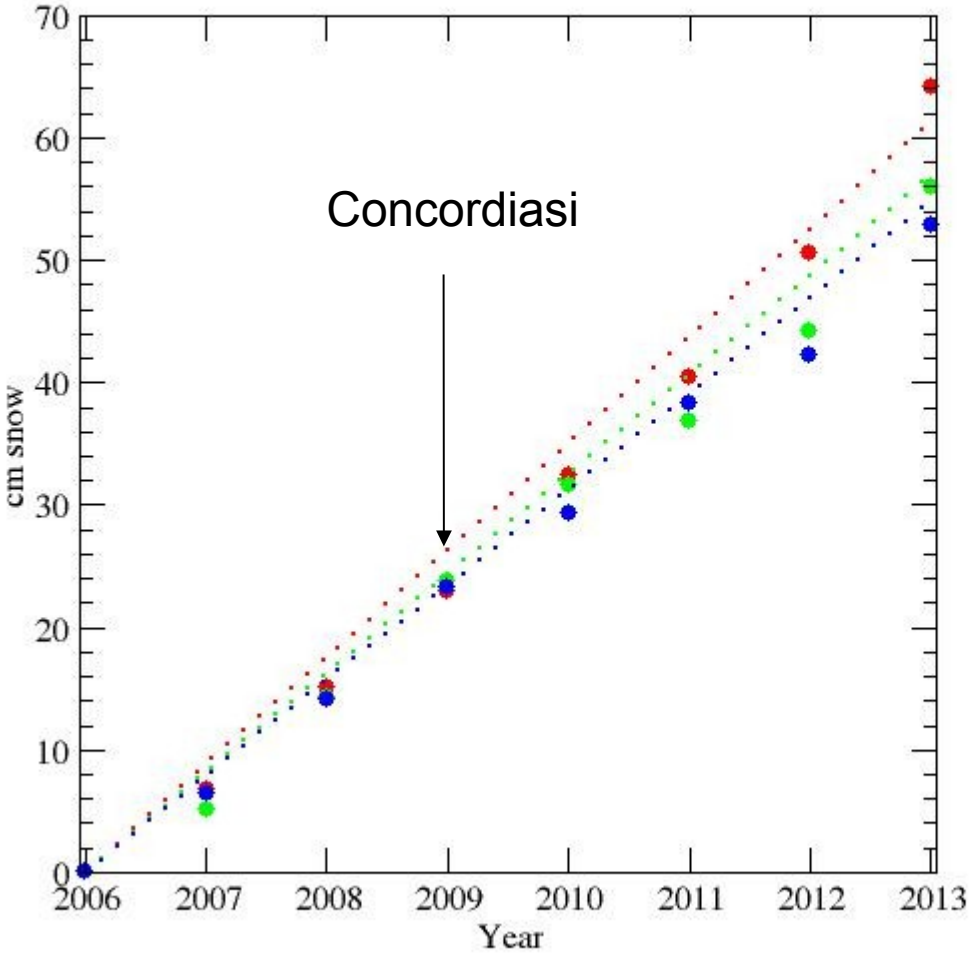
Et pourtant

Les mesures GPR indiquent une accumulation de neige 10 à 20 % plus importante au Nord qu'au Sud (mesures GPR)

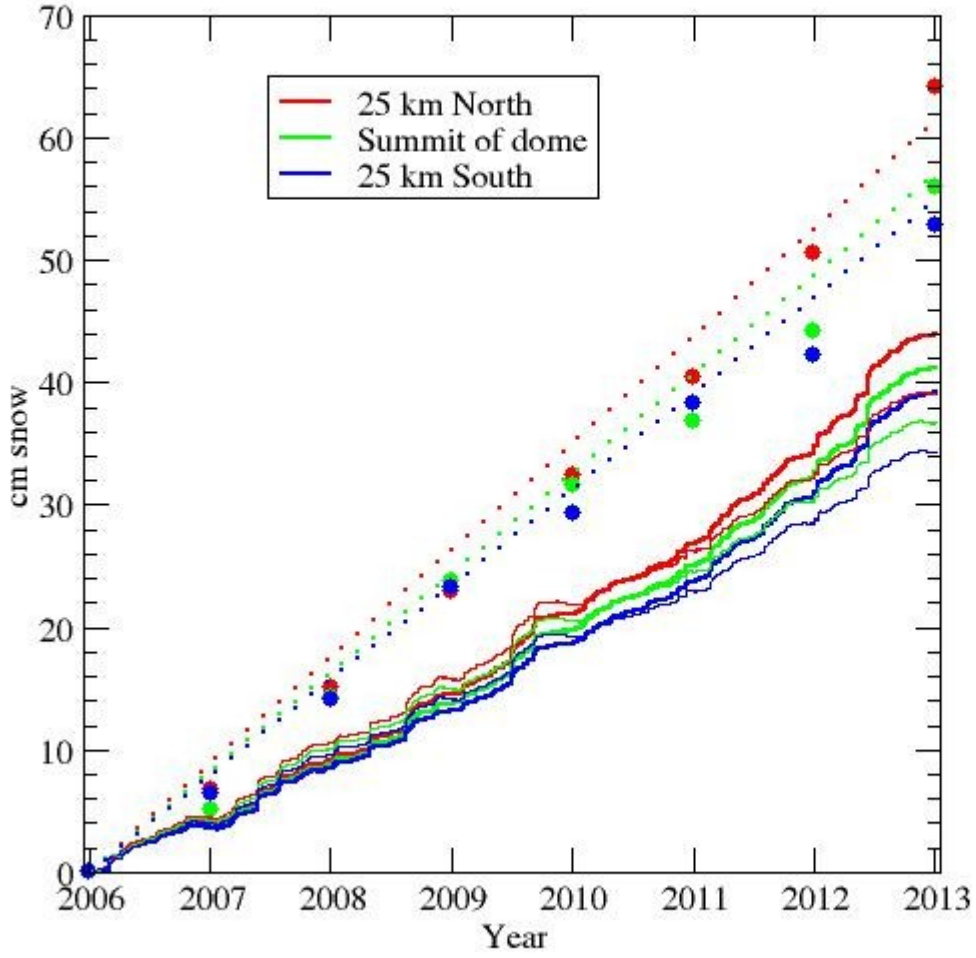


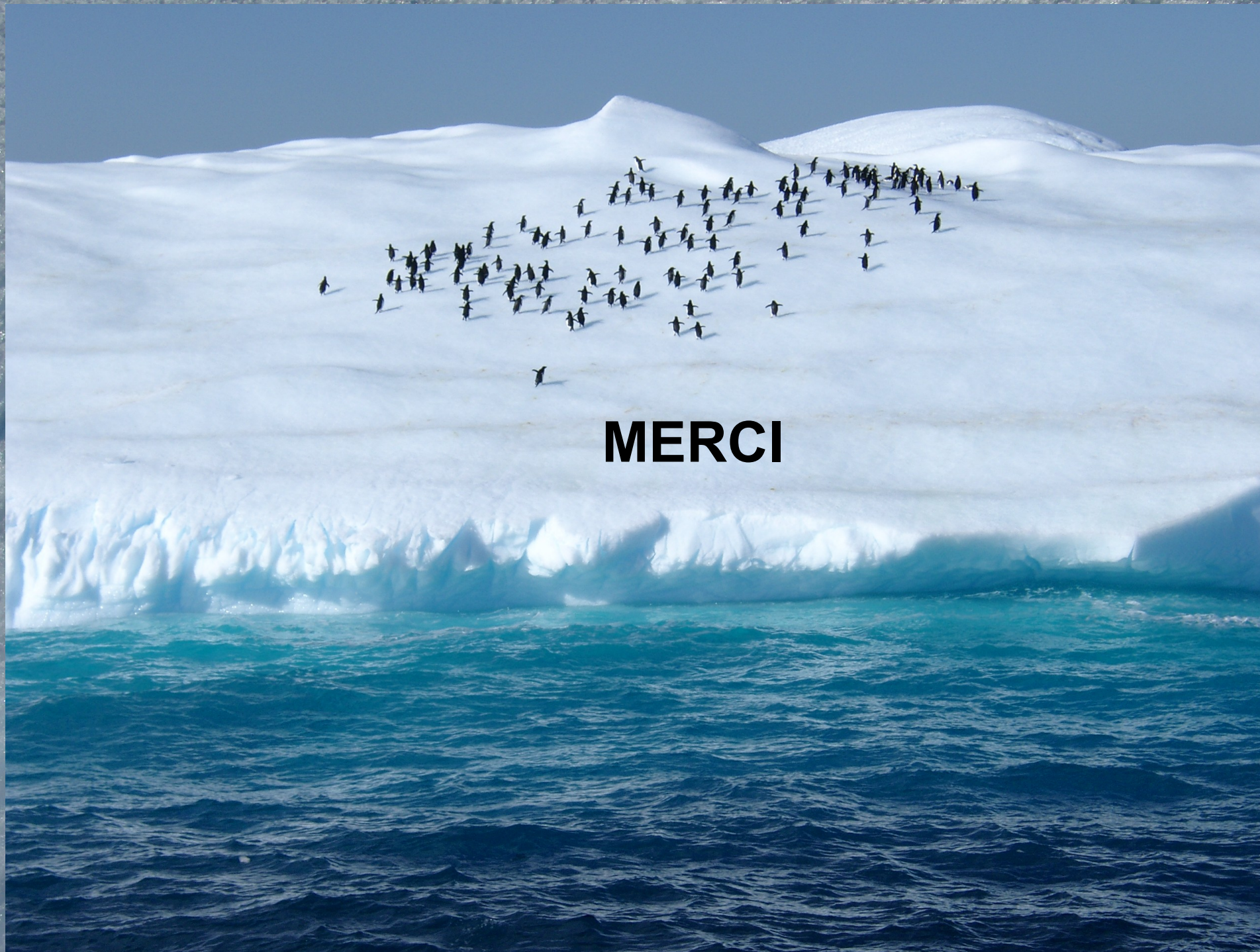


Ce que confirment les réseaux de balises GLACIOCLIM établis en 2006



Et les analyses du CEP




MERCI