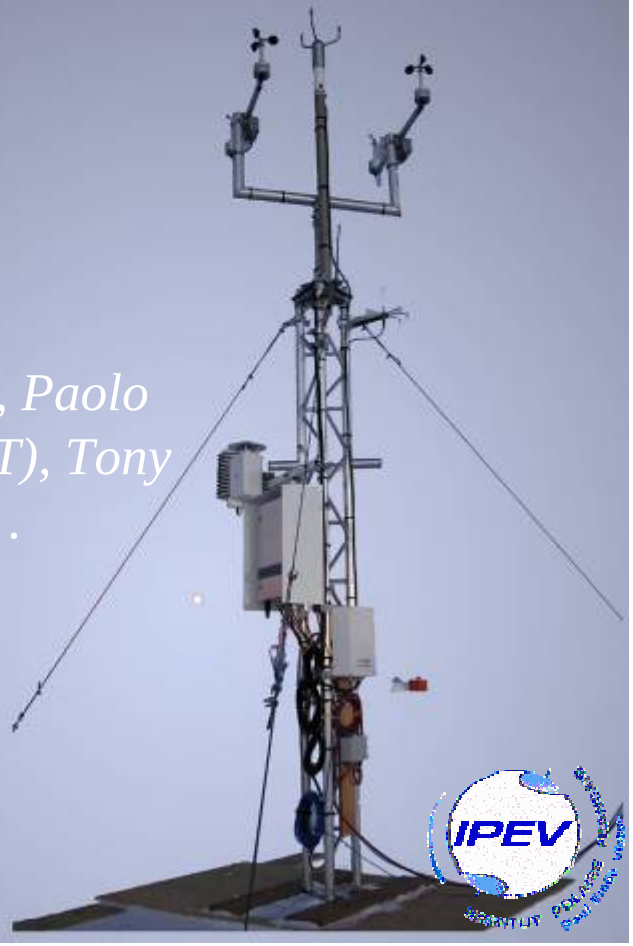
Atmospheric Measurements at Concordia Station

Andrea Pellegrini, PNRA SCrl

Contributions from:
Lucia Agnoletto (ENEA), Stefania Argentini (CNR-ISAC), Paolo Bonasoni (CNR-ISAC), Teodoro Georgiadis (CNR-IBIMET), Tony Travouillon (CALTECH), Vito Vitale (CNR-ISAC)…



Dome C Site

Dome C
Concordia St. (permanent)

Baia Terra Nova
Mario Zucchelli St. (summer)

Cape Prudhomme
Dumont D'Urville (permanent)

Lat. 75°06'S

Long. 123°24'E

3300 m m.s.l

Brest, December 11 2007

Existing Scientific Instruments (Physic of the Atmosphere)

- AWS Concordia
- (AWS Davis and AW11 (summer))
- 12 m Tower: Wind, Temperature, RH sensors at standard levels, pressure and solar radiation sensors.
- 30 m Tower: 4 sonic anemometers (SONICS).
- Radiosounding Station
- BSRN Station
- Ozone Analyzer

Data Distribution at Concordia

Concordia AWS

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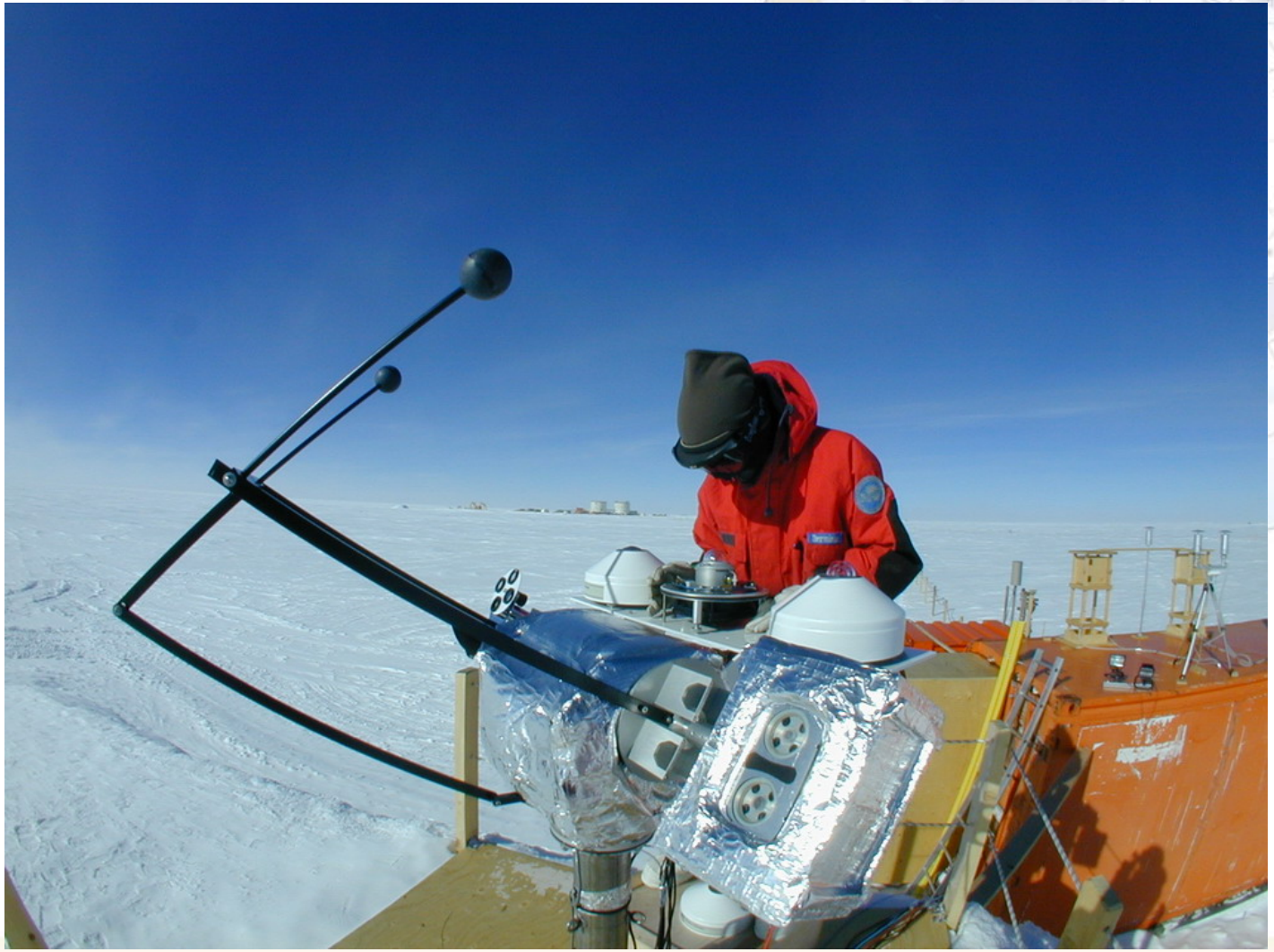
BSRN Station



Data Distribution at Concordia

12 m Tower

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SONICS at the 30 m Tower

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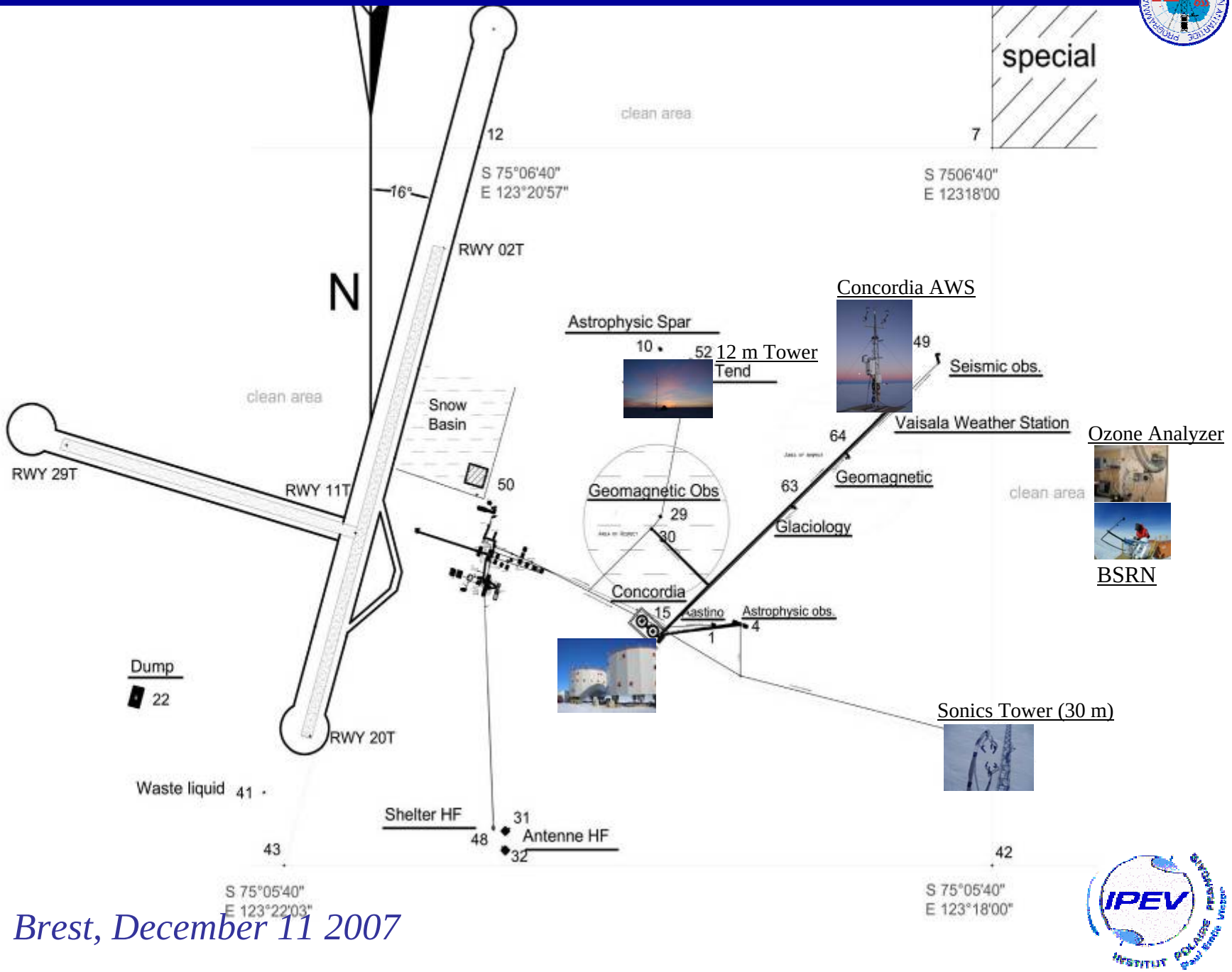
Distribution of the Instrumentation



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Data Dissemination

Real Time AWS Concordia, Davis, AW11, Radiosounding.
Daily BSRN station, statistic values from AWS Concordia.
Weekly Statistic values from AWS Concordia.
Monthly Statistic values from AWS Concordia.
After data are made available to the relevant P.I.'s Data from specific research projects running nearby the two towers (12 and 30 m).

Real Time

Availability	***Source***	***Frequency***	***Whom ask for data***
Real time	Concordia AWS	Continuous data, sampled every 1 min and 30 min	Physics of the atmosphere lab.
Real time, at 12:00 UTC	Concordia Sounding System	Daily	Physics of the atmosphere lab.

Data Distribution at Concordia

Concordia AWS_real time DATASHEET

date, time, temp, RH, press, Wind Speed, Wind Dir

2006/01/16, 00:00, -34.6, 18, 660.6, 3.1, 183
2006/01/16, 00:30, -35.2, 17, 660.5, 3.1, 197
2006/01/16, 01:00, -35.9, 17, 660.5, 3.2, 191
2006/01/16, 01:30, -36.4, 17, 660.4, 2.9, 185
2006/01/16, 02:00, -36.8, 17, 660.4, 2.9, 194
2006/01/16, 02:30, -37.1, 17, 660.4, 2.9, 189
2006/01/16, 03:00, -36.9, 17, 660.4, 3.5, 177
2006/01/16, 03:30, -36.5, 17, 660.5, 3.2, 175
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2006/01/16, 04:30, -36.1, 17, 660.5, 3.4, 163
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2006/01/16, 06:00, -35.1, 17, 660.6, 2.6, 182
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2006/01/16, 13:00, -25.8, 18, 659.8, 5.6, 202
2006/01/16, 13:30, -25.5, 18, 659.8, 5.5, 197
2006/01/16, 14:00, -25.3, 18, 659.8, 5.1, 196
.....

RADIOSOUNDING DATASHEET

EDT LEVEL OUTPUT

Time	Height	P	T	U	WS	WD
0000	3260	642.3	-62.25	56	2.3	197
0002	3265	641.8	-60.45	55	6.4	186
0004	3270	641.3	-47.65	56	7.5	184
0006	3282	640.2	-41.85	57	7.9	184
0008	3295	639	-40.45	58	8.4	184
0010	3304	638.1	-39.65	60	8.7	184
0012	3313	637.2	-39.15	61	9.1	184
0014	3324	636.2	-38.75	61	9.3	183
0016	3336	635.1	-38.35	62	9.4	183
0018	3349	633.9	-38.05	63	9.5	183
0020	3360	632.9	-37.75	63	9.6	183
0022	3370	632	-37.55	63	9.5	183

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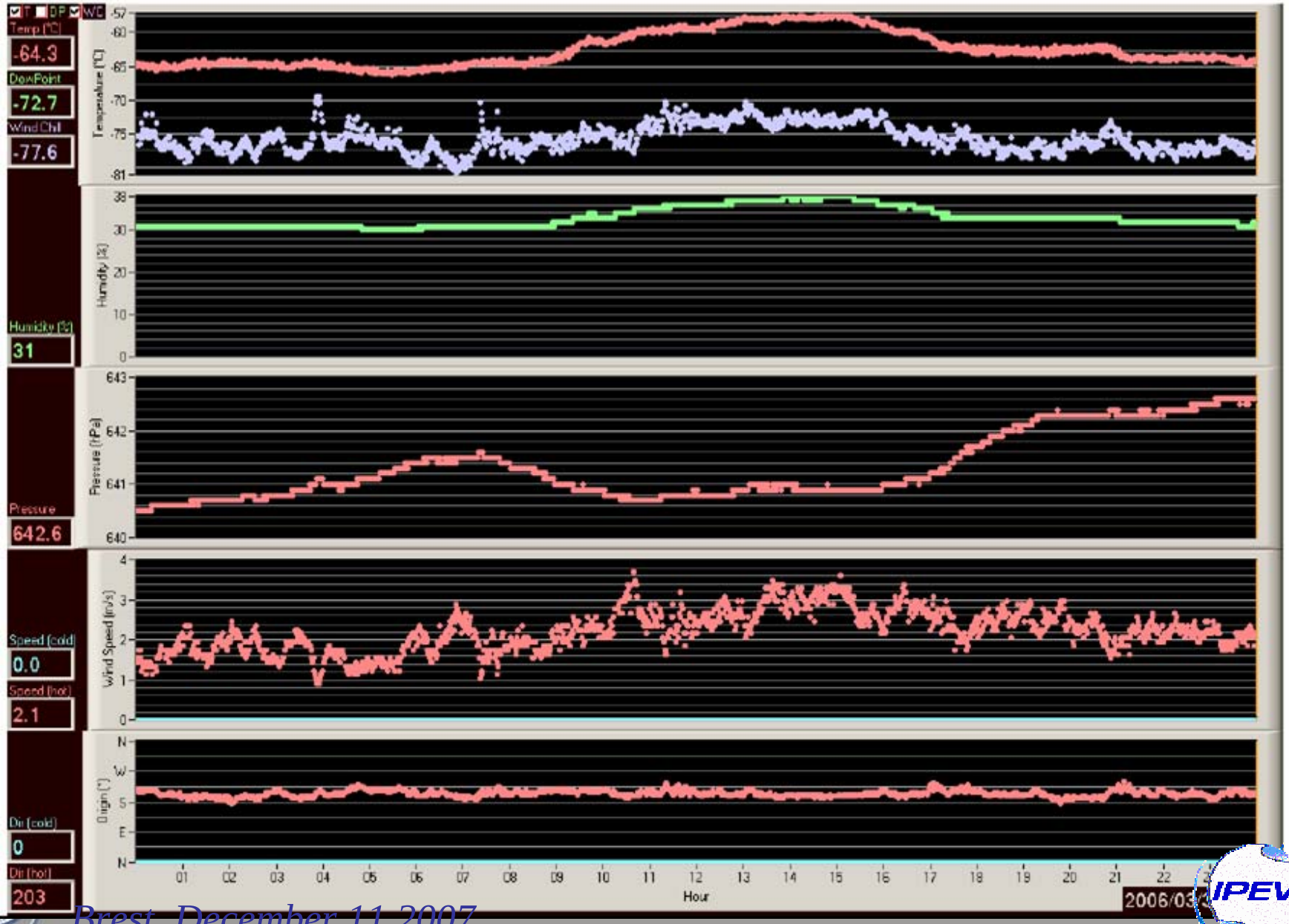
Data Distribution at Concordia

Concordia AWS_printscreen of the monitoring software



Daily

Availability	***Source***	**Frequency**	***Whom ask for data***
daily	BSRN station	1 min	Physics of the atmosphere lab.
daily	Concordia AWS	Average daily values	Physics of the atmosphere lab.

Data Distribution at Concordia

BSRN Output File

#domec	18	1	2006	-750 999 985	-236 619 995	
	#(02)ora	(03)min	(04)az	(05)el	(06)globale	(07)diffusa
	5	0	110.108	16.635	319.0675964	48.4951973
	5	1	109.872	16.695	320.4365845	48.6300621
	5	2	109.637	16.755	321.8111877	48.7378426
	5	3	109.402	16.816	323.2370911	48.8763199
	5	4	109.167	16.876	324.611145	48.9938622

(08)dirCH1_scalata	(09)dirEPP_scalata	(10)longpt100	(11)longtermistore	(12)tpt100	(13)stdglobale	(14)maxglobale
284.7080383	285.0669861	95.6686172	84.5113983	-34.7324104	0.396913	319.7574158
285.9355774	286.2977295	95.7322464	84.4853516	-34.6923752	0.4067832	321.1346436
287.1949158	287.5310364	95.6135101	84.3492889	-34.6866798	0.4048952	322.4793701
288.4639282	288.8127747	95.5519485	84.2929153	-34.6818542	0.4138799	323.8948669
289.7528992	290.1230164	95.542572	84.3342285	-34.679985	0.3932128	325.3124084

(15)minglobale	(16)stddiffusa	(17)maxdiffusa	(18)mindiffusa	(19)stddirettaCH1_sc	(20)maxdirettaCH1_sc	(21)mindirettaCH1_sc
318.4391479	0.0612703	48.6377106	48.379631	0.3601979	285.3665161	284.0686951
319.7799988	0.0609632	48.7469063	48.4888535	0.3663049	286.5198975	285.1622009
321.1346436	0.0744677	48.8930779	48.599144	0.3810444	287.8853455	286.5218506
322.5460205	0.0602325	49.0039673	48.7827644	0.3855194	289.0800781	287.7315369
323.9353027	0.0556373	49.1131516	48.8936272	0.3791062	290.3747253	289.0296021

(22)stddirettaEPP_sc	(23)maxdirettaEPP_sc	(24)mindirettaEPP_sc	(25)stdlongpt100	(26)maxlongpt100	(27)minlongpt100	(28)stdlongtermistor
0.3608583	285.7101135	284.3691406	0.0381144	95.7888794	95.6349106	0.0500345
0.3593954	286.8740234	285.6060486	0.0276836	95.7645874	95.7041626	0.0394012
0.3719934	288.1403503	286.8535156	0.0580578	95.7140732	95.460556	0.0473159
0.3982938	289.4983826	288.1127625	0.0455151	95.653656	95.4936829	0.0477478
0.3957667	290.8260803	289.4297791	0.0597872	95.653656	95.4664841	0.0554786

(29)maxlongtermistor	(30)minlongtermistor	(31)stdtpt100	(32)maxtpt100	(33)mintpt100
84.5820999	84.4128418	0.0069538	-34.7140007	-34.7350006
84.5306396	84.3617554	0.0004858	-34.6920013	-34.6930008
84.4559402	84.2752914	0.0158053	-34.6489983	-34.7130013

Weekly and Monthly

Availability	*Source*	*Frequency*	*Whom ask for data*
Weekly	Concordia AWS	Average weekly values	Physics of the atmosphere lab
Monthly	Concordia AWS	Average monthly values	Physics of the atmosphere lab
Monthly	Concordia AWS	1 day hourly files of the past month	Physics of the atmosphere lab
Monthly	Concordia AWS, Radiosoundings	All the data (passing the survey) of the past month	***www.climantartide.it***

More information and data download:

http://www.climantartide.it

Uncertainty of the Measurements

- All data provided in real time and near-real time at Concordia are preliminary, raw data; they need to be validated ... and it takes time. All these data are, anyway, provided on-site to support and to ease the work of the scientific comunity.
- Temperature: ± 0.1 °C
- Relative Humidity: “critical”...
- Pressure: ± 0.3 hPa
- Wind Speed: ± 1 Kts (*warning*)
- Solar Radiation: ± 3 Wm^2 raw-data, the target of the BSRN is the highest of ± 1Wm^2 or 2%.

Data from Specific Research Projects

Source	**Frequency**	*Whom ask for data (P.I.'s)*
BSRN	1 min •Optical Thickness •Atmospheric Transmittance •Cloud Cover	Vito Vitale *vito.vitale@isac.cnr.it*
STABLEDC 2005	10 min •Vertical Profiles till 300 m •Surface Meteorology	Stefania Argentini *stefania.argentini@artov.isac.cnr.it*
SONICS	1 min •Temperature, Wind Speed and their Vertical Gradient till 30 m	Tony Travouillon *tonyt@caltech.edu*
OZONE	1 min, 30 min •Ozone concentrtion	Paolo Bomasoni *p.bonasoni@isac.cnr.it*

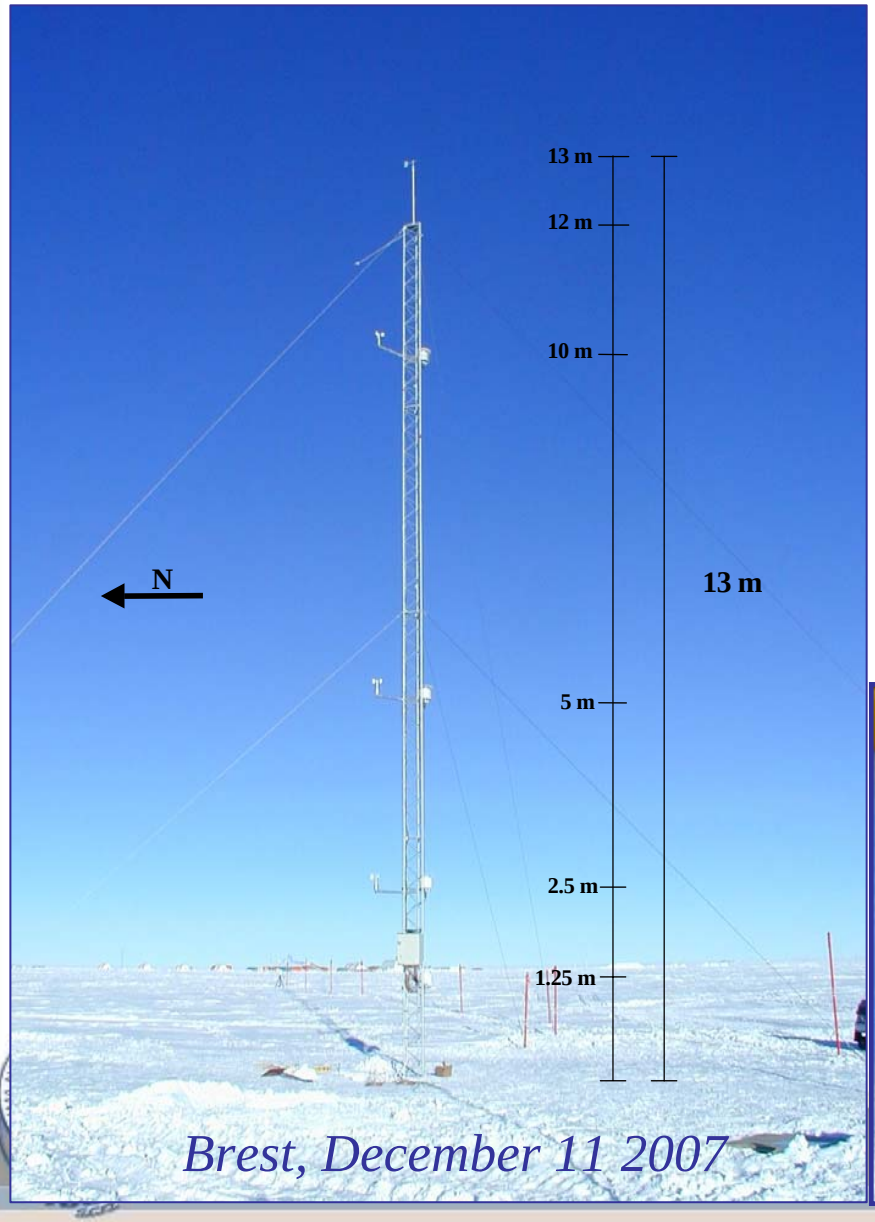
STABLEDC (STABLE boundary layer at Dome C) - Scientific objectives

General objective : Study of the processes occuring in PBL

- Monitoring of PBL atmospheric parameters
- Energy and radiation budget
- Parameterization of the long - lived stable boundary layer
- Summer weak convective boundary layer observations
- Behaviour of the temperature inversion during the year
- Periodicity, occurrence of the warming events during the winter
- Interaction between local and large scale circulation

Data from Specific Research Projects - STABLEDC

Surface Layer Meteorological Measurements



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METEO TOWER Measurements

- **1.25 m: Temperature**
- **2.5 m, 5 m, 10 m : Temperature - Wind Speed - Relative Humidity**
- **12 m Net Radiometer**
- **13 m Wind Direction**

- **Surface Layer Profiles (Wind, Temperature, Humidity)**
- **Surface Layer Fluxes (Heat and Momentum) using GRADIENT METHOD**

Conventional HFP01 heat flux plates at depth of 0, 5, 15, 30, 50 cm

HEAT FLUX PLATES MEASUREMENTS

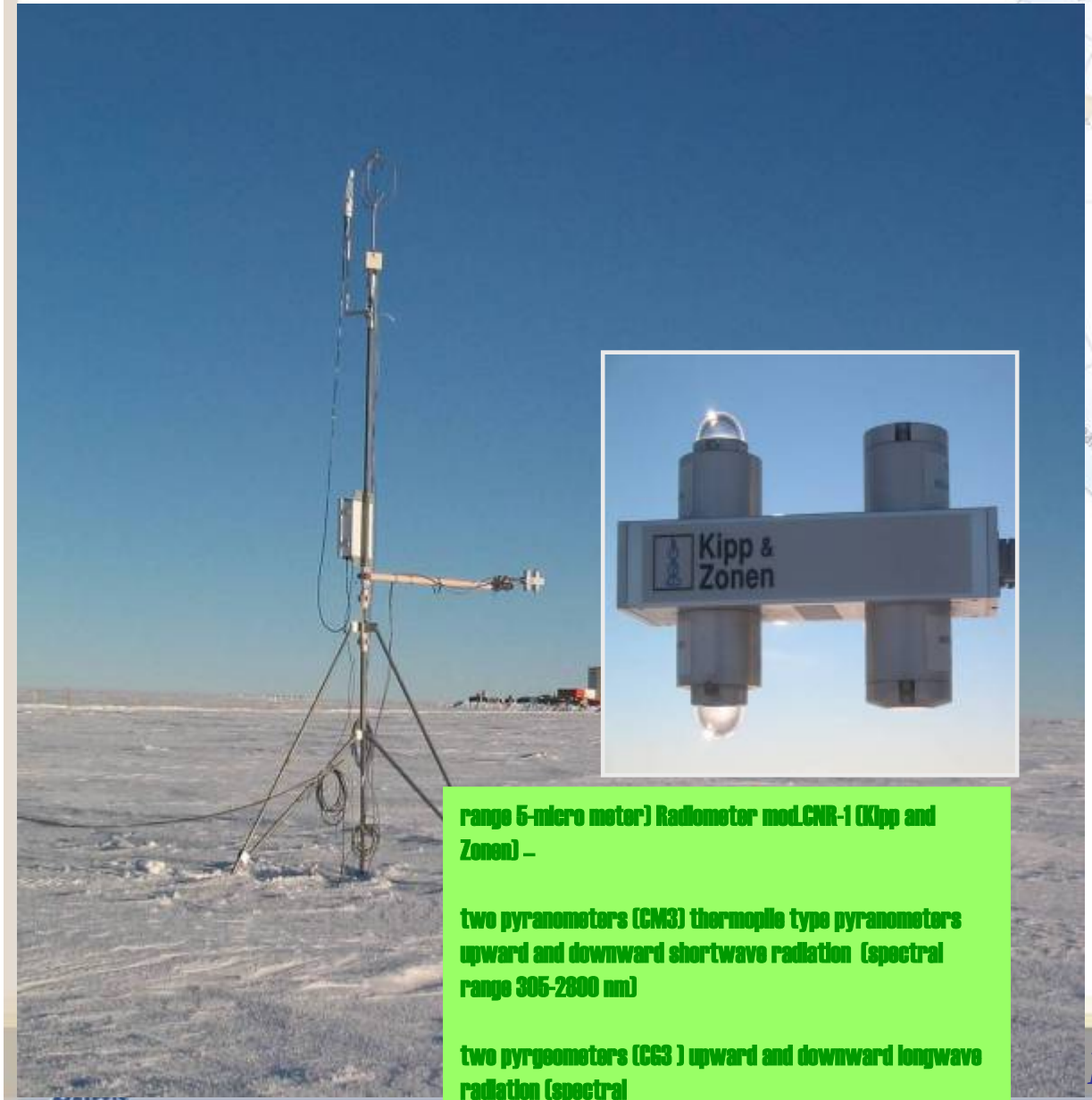
Sub-surface energy fluxes

THERMOMETERS

Snow temperature profiles

Data from Specific Research Projects - STABLEDC

Surface Layer Turbulence



range 6-micro meter) Radiometer mod.CNR-1 (Kipp and Zonen) –

two pyranometers (CM3) thermopile type pyranometers upward and downward shortwave radiation (spectral range 305-2800 nm)

two pyrgeometers (CG3) upward and downward longwave radiation (spectral

Sonic anemometer measurements

- **Wind components : u, v, w**
- **Sonic Temperature (sort of virtual temperature)**

EDDY CORRELATION METHOD

- **Turbulent Fluxes (Heat, Momentum)**
- **Turbulent Kinetic Energy**

RADIOMETER MEASUREMENTS

Radiative budget:

- **Incoming and outgoing shortwave and longwave radiation.**
- **Albedo**

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Ground based remote sensing: meteorological temperature profiler (MPT-5P)

SPECIFICATIONS:

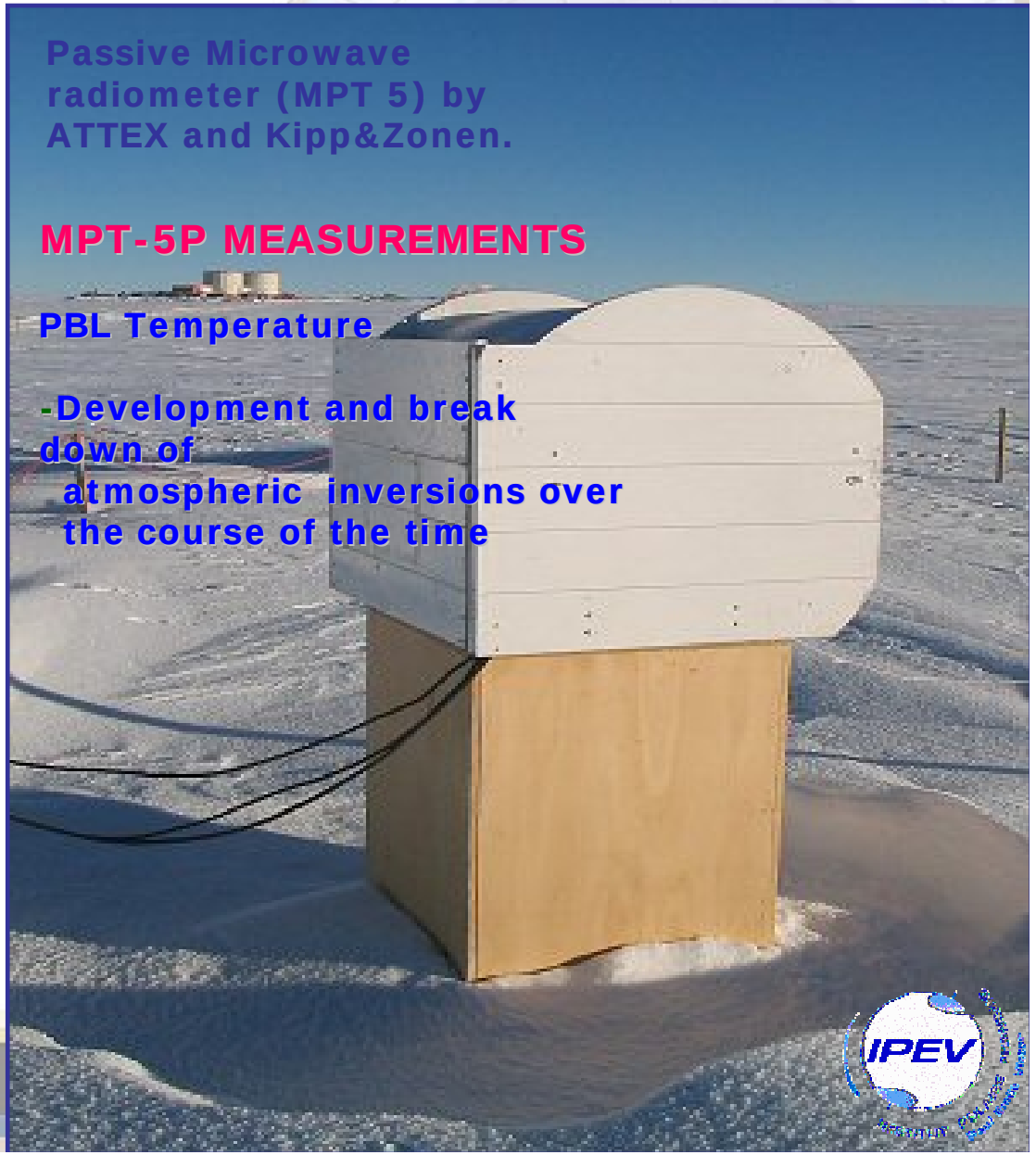
Altitude	0 –600 m
Altitude resolution	0 – 100 m — 10m 100 –200m — 15m 200 –300m — 50m >300m
Measurement cycle	300 sec minimum
Accuracy of temperature profile	±0.5oC
Central measurement frequency	60.4 GHz
Receiver sensitivity	0.04 oC at 1sec integration time
Number of measurement angles	34
Power requirement	220 VAC /50 – 60 Hz
Power consumption (+12V)	— 120W max — 40W nominal (220VAC) — 200W max — 60W nominal
Ambient temperature range	– 50o C — +45oC
Calibration	Self-calibrating relative to ambient air

Passive Microwave radiometer (MPT 5) by ATTEX and Kipp&Zonen.

MPT-5P MEASUREMENTS

PBL Temperature

-Development and break down of atmospheric inversions over the course of the time



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Ground based remote sensing: SODAR (Sound Detection and Ranging)

Triaxial monostatic Doppler mini-sodar

Range 12 - 400 m
Resolution 13 m

Acoustic tones FREQUENCIES :
2000 – 2500 – 3000

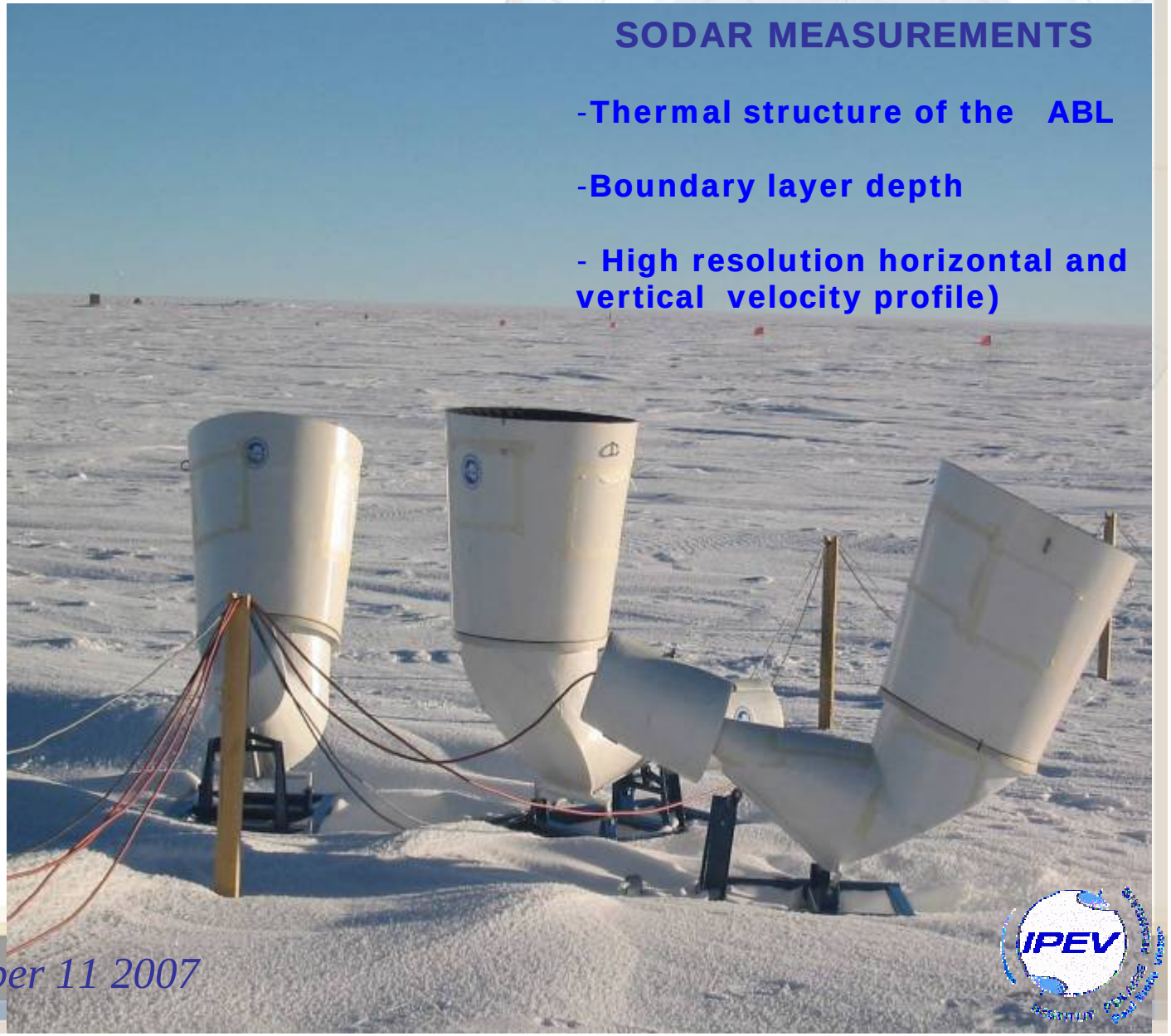
Echoes are given by temperature fluctuation in monostatic configuration

SODAR MEASUREMENTS

-Thermal structure of the ABL

-Boundary layer depth

- High resolution horizontal and vertical velocity profile)



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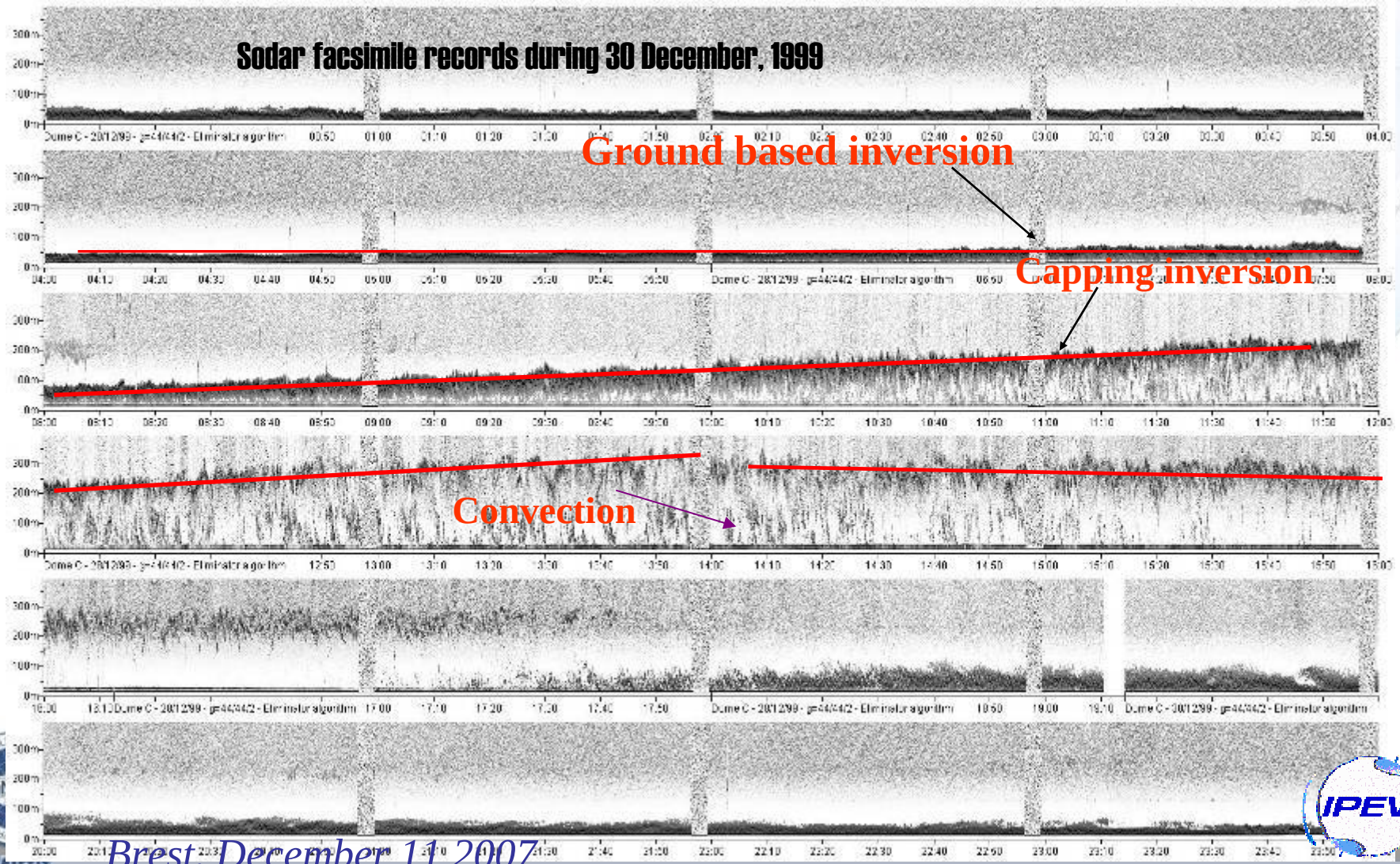
Data from Specific Research Projects - STABLEDC

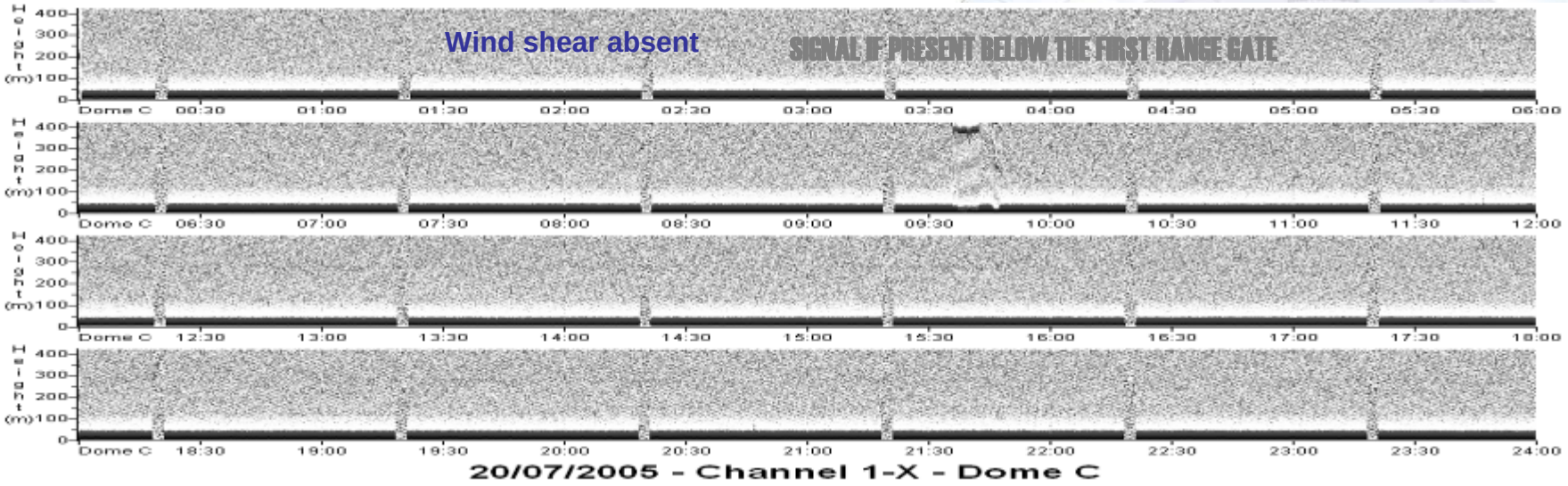
Convective Boundary Layer observed during the summer at Dome C

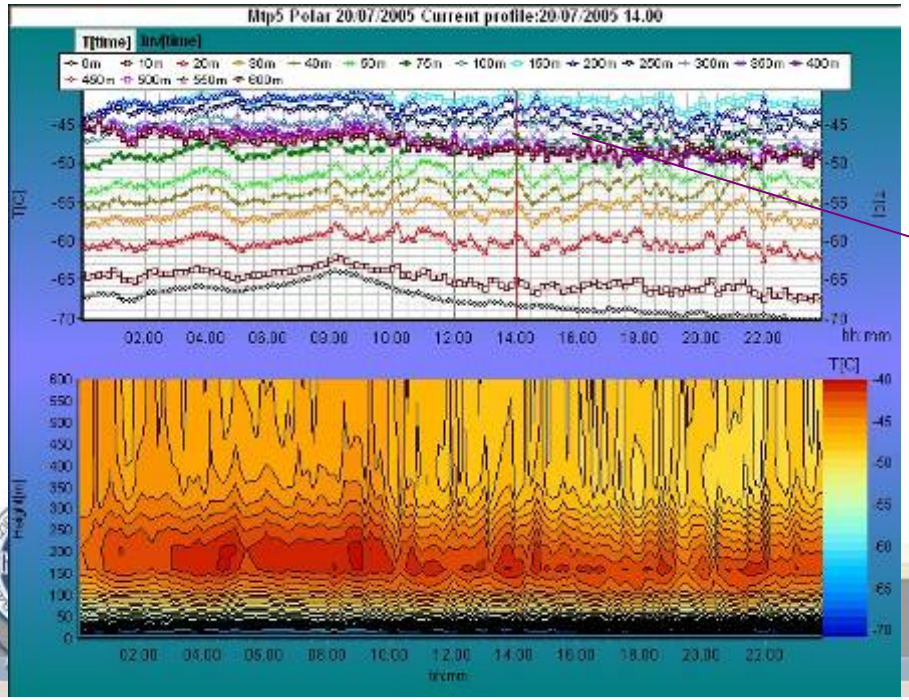
Convective coherent structures delimited by a capping inversion start to be present at 0900 LST in the morning. The capping inversion reaches the maximum height around 1300 LST.

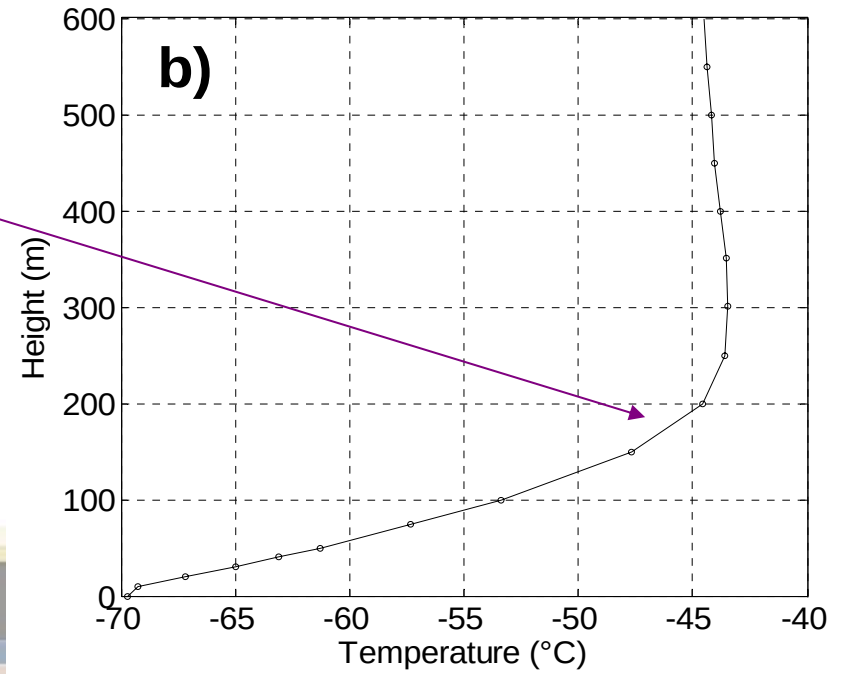


Data from Specific Research Projects - STABLEDC

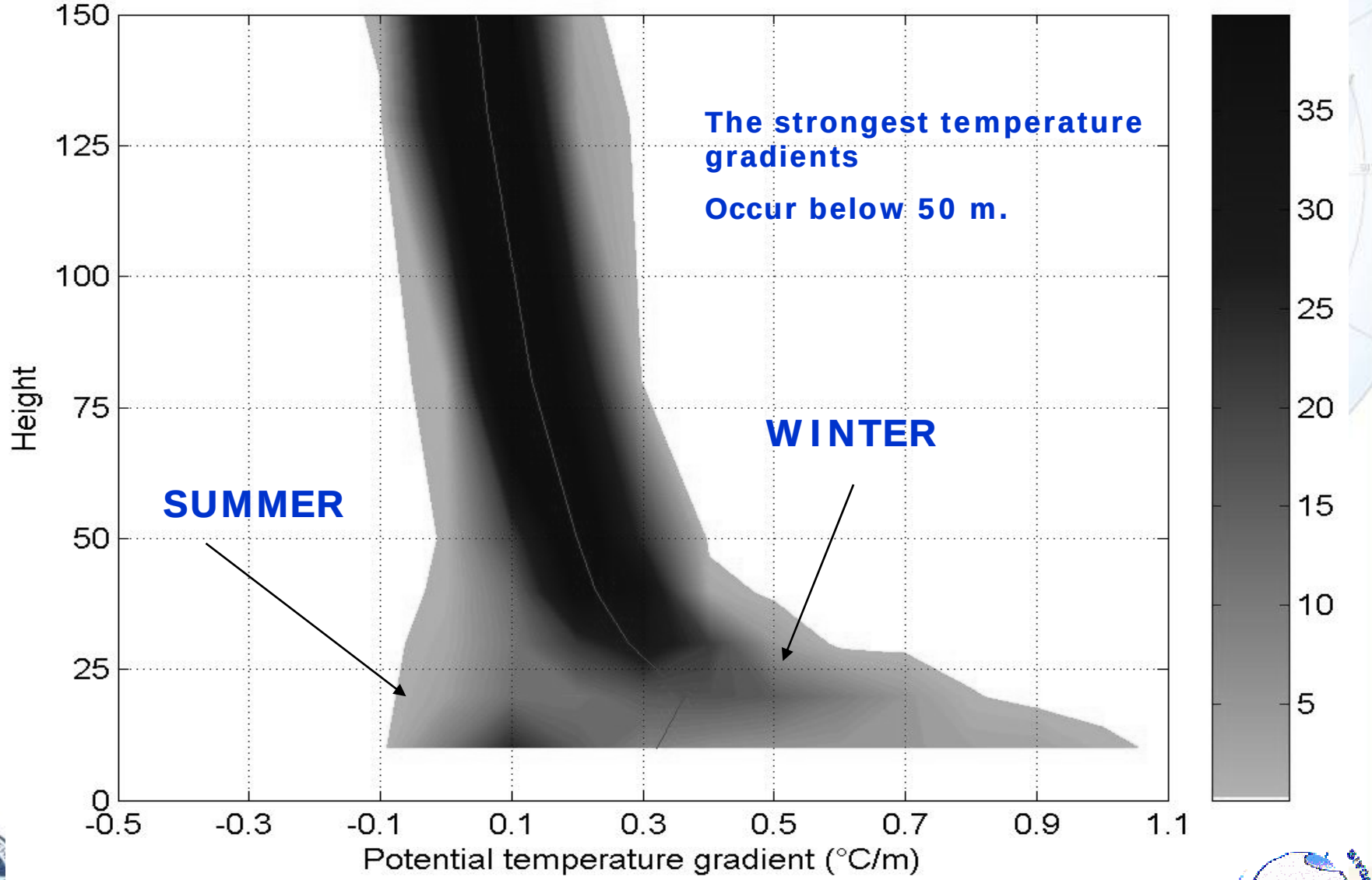
Stable Boundary Layer observed during the winter







Colour zone graphic of potential temperature gradient



Data from Specific Research Projects – BSRN Station

BSRN (Baseline Surface Radiation Network) is a project of the World Climate Research Programme (WCRP) aimed at detecting important changes in the earth's radiation field which may cause climate changes. At a small number of stations in contrasting climatic zones, covering a latitude range from 80°N to 90°S, solar and atmospheric radiation is measured with instruments of the highest available accuracy and at a very high frequency (minutes).

The BSRN station at Dome C is very important for :

- supplying with high accuracy essential input parameters to both **mass balance and climatic models** for a crucial area.
- giving accurate and representative information on the **radiation regime at the surface** in the East-Antarctic Plateau region.
- **validating satellite measurements** as well as **climatic models,** parametrization schemes and results.
- giving useful information for **PBL studies** and characterizations.

Since 2006 a BSRN *basic measurement programme* (global, direct and diffuse solar radiation and down-welling atmospheric radiation) was implemented.

During this austral campaign, up-welling radiation measurements will be implemented. Instruments will be placed on an albedo rack of 4 m height to reduce errors in the albedo evaluations.

A calibration facility is being developed in Bologna at the ISAC-CNR Institute.

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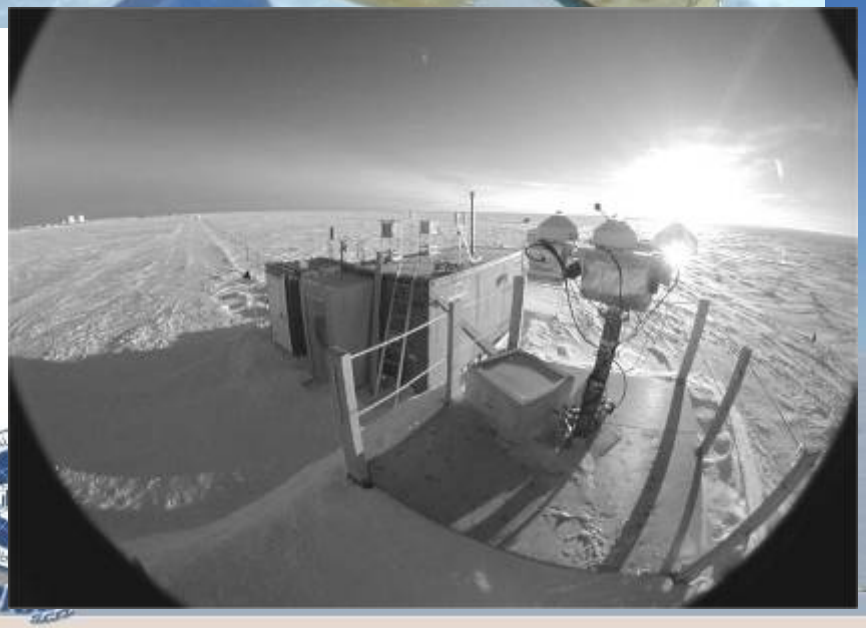
Data from Specific Research Projects – BSRN Station



Data from Specific Research Projects – BSRN Station

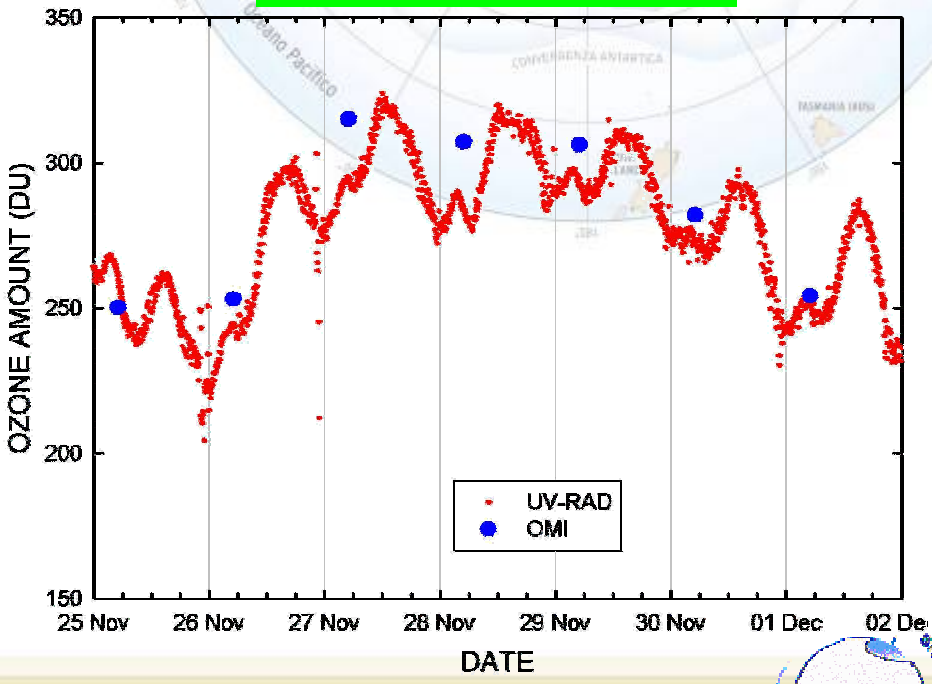
Spectral UV measurements at Concordia

At the beginning of November have been installed an UV-RAD radiometer to carry out spectral measurements in the range between 300 and 400 nm and supply ozone content, UV flux and other parameters along the whole day.

Narrowband filter radiometer for ground-based measurements of global ultraviolet solar irradiance and total ozone

Petkov B., Vitale, V. et al., *Applied Optics*, 2006

Preliminary analysis



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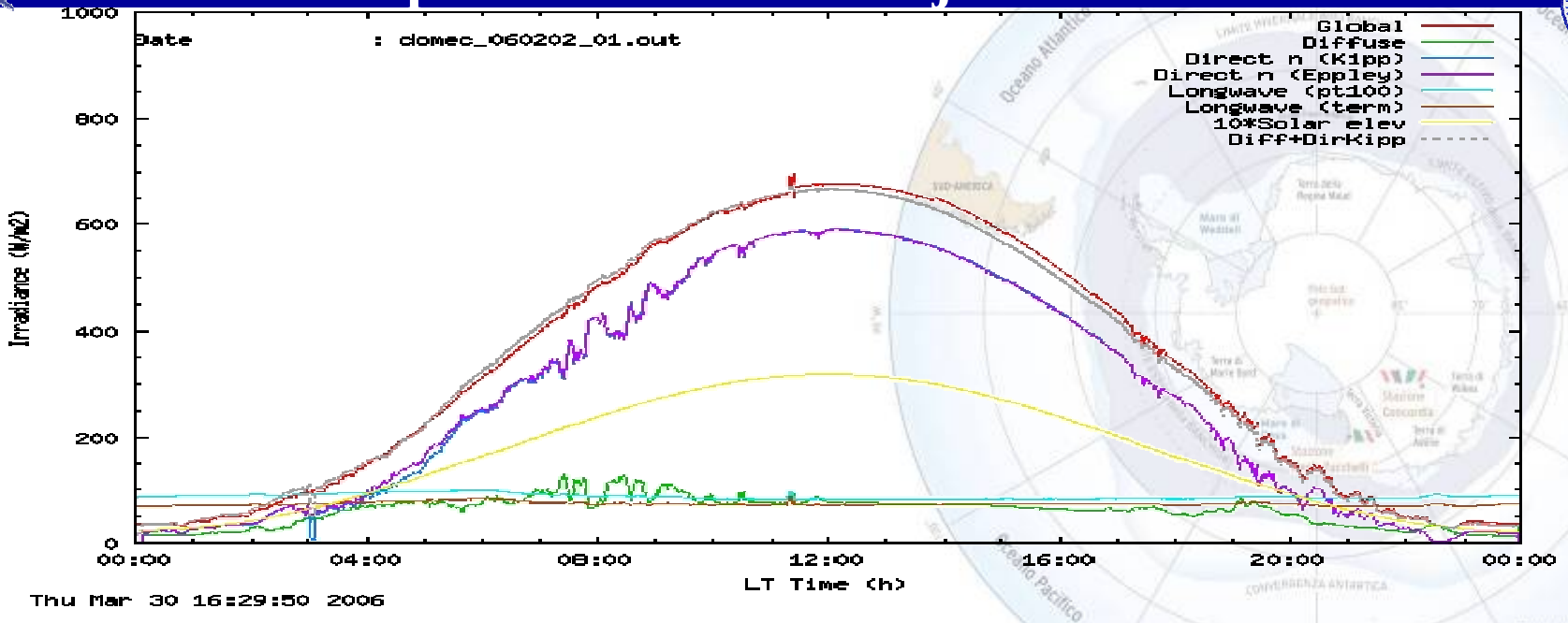
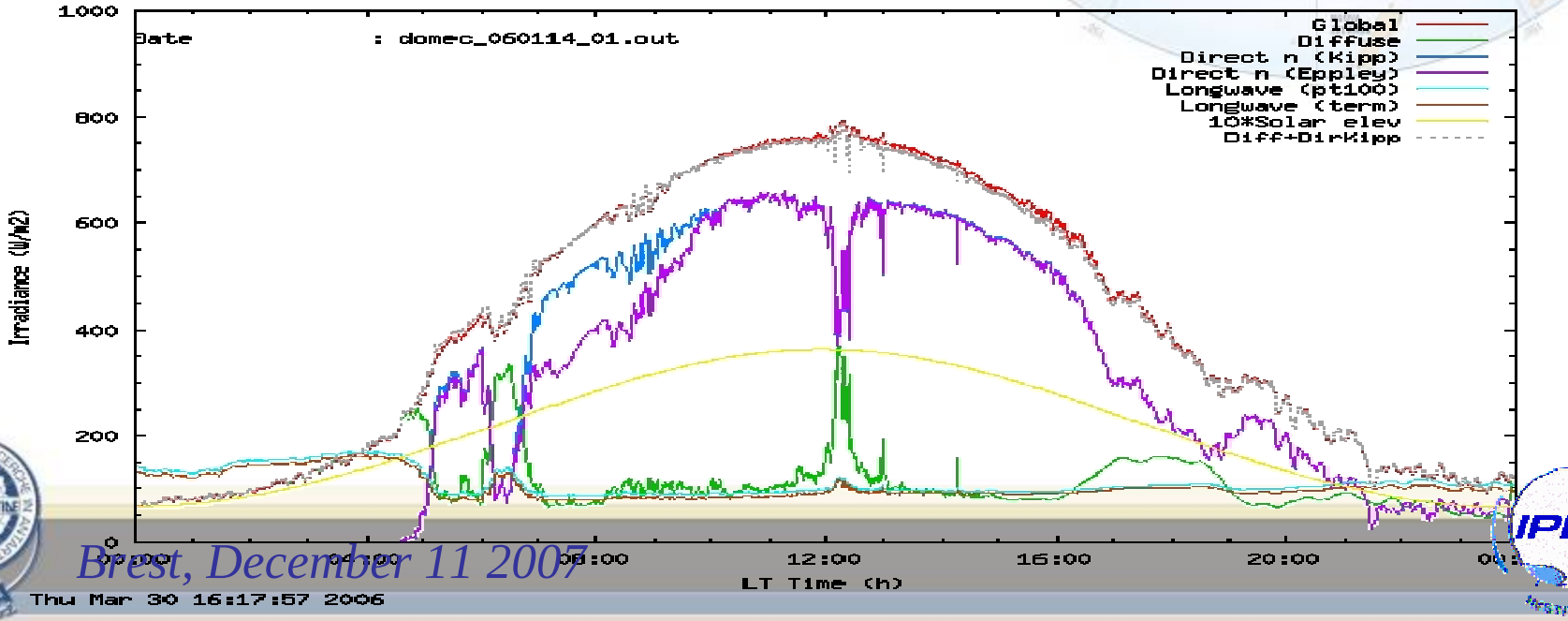
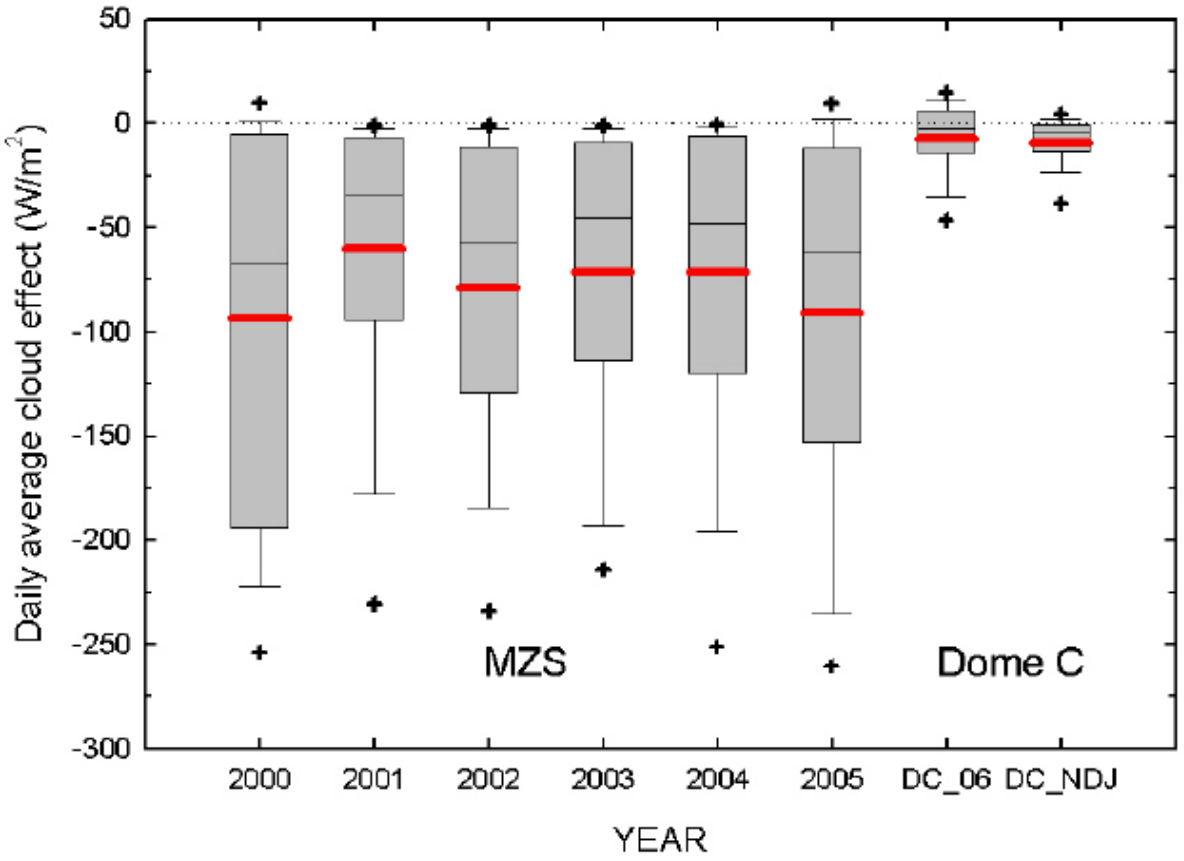
Data from Specific Research Projects – BSRN Station



BSRN – DomeC – daily plot



Cloudiness characteristics at MZS and Concordia



The cooling effect of clouds at MZS ranges between -40 and -110 W/m^2 for all three summer months, being positive cloud effects confined in less than 1% of the cases. At Dome C, radiative effects are much less intense, not being stronger of -20 W/m^2. Moreover, positive effects represent a consistent part of the histogram distribution

Data from Specific Research Projects – TAVERN

TAVERN project

a cooperation between

TABLE 1 (PAGE 1): DETAILED DESCRIPTION OF USED SYSTEMS WITHIN THE PROJECT (MOST OF THEM FUNDED YET)
IN BLUE ARE GIVEN THE MEASUREMENTS THAT WILL BE CARRIED OUT IN THE FRAME OF OTHER PROJECTS

System	Derived Parameter	Time Resolution	[illegible]	Responsible Scientist	Space/Power
Remote Sensing & In-Situ					
Automatic 532-1064 nm LIDAR	Profile of backscattering & coefficient, depolarization	10 minutes		M. del Guasta, IFAC-CNR Florence-Italy	container 1 (20 feet) 2-3 m²
SP-02 Dual Channel Spectrometer/ ISAC-CMDL sun photometer	Columnar AOD (285 - 1100nm)	10 minutes		V. Vitale, ISAC CNR Bologna, Italy/ E. Dutton, NOAA CMDL, Boulder, USA	outside & container 2
PREDE sky radiometer	sky brightness measurements	10 minutes		V. Vitale, ISAC CNR Bologna, Italy	outside & container 2
Sun photometer	Columnar AOD (400 – 1060 nm)	10 minutes		A. Herber, AWI Bremerhaven	container 2, [illegible]
3-channel nephelometer TSI	Scattering coefficient	20 minutes		A. Virkkula, FMI Helsinki, Finland	container 1
CPC	cloud nucleation & total number concentration of aerosol particles	20 minutes		K. Hämeri / A. Virkkula, FMI Helsinki, Finland	container 1
3-channel PSAP or aethalometer	control of Environment situation	20 minutes		K. Hämeri, FMI Helsinki, Finland	container 1
DMPS (10 - 500 nm diameter [illegible]) and an optical particle counter from about 0.3 to 20 µm	Size distribution of aerosol particles	30 minutes		K. Hämeri / A. Virkkula, FMI Helsinki, Finland	container 1
LAS-X – Optical particle counters	Size distribution (atmospheric snow [illegible])	hourly		A. Herber, AWI Bremerhaven	outside & container 1 or 2
Chemical Systems					
8-stage impactor and 12 stage impactor (0.03 to 20 µm)	Size segregated chemical species	Weekly / Bi-Weekly		R. Udisti, University of Florence, Italy in cooperation with A. Virkkula and M. Legrand	container 3
Sandwich sampling (2-3 stages)	Size segregated chemical species	2-3 days		R. Udisti, University of Florence, Italy	container 3
Low volume [illegible] PM10 PM2.5 [illegible] filter	Size segregated chemical species	2-3 days		R. Udisti, University of Florence, Italy	container 3
Entry the atmospheric gases	SO2, H2O2, DMS, HCHO, HCl, HNO3 and ozone	Weekly for SO2, HCl, HNO3, and DMSO; daily for DMS, and continuous for H2O2, HCHO and ozone		M. Legrand, LGGE Grenoble, France in cooperation with R. Udisti, University of Florence, Italy	container 3 and 4
High volume filter	Sulphur species (MSA, sea salt, [illegible] sulfate) and isotopic measurements	Weekly		M. Legrand, LGGE Grenoble, France	container 4

TABLE 1 (PAGE 2): DETAILED DESCRIPTION OF USED SYSTEMS WITHIN THE PROJECT (MOST OF THEM FUNDED YET)
IN BLUE ARE GIVEN THE MEASUREMENTS THAT WILL BE CARRIED OUT IN THE FRAME OF OTHER PROJECTS

System	Derived Parameter	Time Resolution	[illegible]	Responsible Scientist	Space/Power
radio-aerosols	Be and Pb 210	3-hours		M. Legrand, LGGE Grenoble, France	container 4
On-site chemical analyses (special equipment) (5 devices)	Ion Chromatography (2 devices)	----		M. Legrand, LGGE Grenoble, France / R. Udisti, University of Florence, Italy	1 lab [illegible] (at least 25 m²)
	Gas Chromatography, ozone, H2O2 and HCHO analysers	----		M. Legrand, LGGE Grenoble, France	
Monitoring of superficial snow and hoar chemical composition	Ion Chromatography	Daily to weekly		R. Udisti, University of Florence, Italy	
high volume impactor and [illegible] measurements	total aerosol mass	2-3 days		C. Scarponi, University of Ancona, Italy	outside & space in the cylinder
[illegible] measurements	heavy metals (Cd, Pb, Cu)	3 days-weekly		C. Scarponi, University of Ancona, Italy	lab in the cylinder
Additional Activities (Meteorology, trace gases, PBL and remote sensing studies)					
Radiation measurements	Shortwave and longwave radiation	1 minute		V. Vitale, ISAC CNR Bologna, Italy / M. Nardino, IBIMET CNR, Italy	Radiation field and container 2 (1 m²)
Surface Meteorological data	PTU, wind (2 m and diff. height)	1 minute		A. Pellegrini, ENEA Roma, Italy	Met tower
Flask sampling	CO2, CH4, halo-carbon	Weekly		P. Bonasoni, ISAC CNR Bologna, Italy / NOAA CMDL (?)	container 2
Ozone monitor	Ozone	continuously		P. Bonasoni, ISAC CNR Bologna, Italy	container 3
CO2 monitor	CO2	continuously		P. Bonasoni, ISAC CNR Bologna, Italy	container 3
Mini - SODAR	PBL wind profile	continuously		S. Argentini, ISAC CNR Roma, Italy	Place outside + container 1
Meteorological Temperature Profiler (MTP-5H)	PBL temperature profile	10 minutes		S. Argentini, ISAC CNR Roma, Italy	Place outside + container 1
temperature profile from [illegible] surface to 10 m (2 levels in snow + 3 levels in air) and radiation flux	surface energy budget conditions	10 minutes		T. Georgiadis, IBIMET CNR Bologna, Italy	10 m [illegible] tower
Precipitation [illegible]	Precipitation and Accumulation	continuously		M. Frezzotti, ENEA Roma, Italy / C. Genthon, LGGE Grenoble, France	Place outside
Radiosounding system	Vertical profile of PTU and wind	Daily or twice per day		A. Pellegrini, ENEA Roma, Italy / C. Genthon, LGGE Grenoble, France	Standard Shelter [illegible] facility

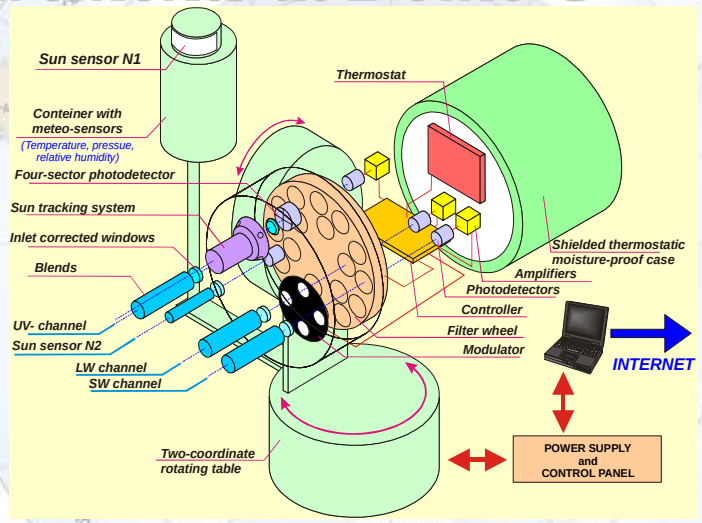
A very large number of measurements will be carried out for a complete characterization of the atmospheric aerosol particles and thin clouds over the East Antarctic Plateau.

Many physical quantities will be carried out by other projects (in blu). Moreover, in-situ chemical samples and measurements are carried out **(Udisti, Legrand)** also in cooperation with Glaciology. Most part of chemical activities started in January 2005, some in-situ measurement in January 2006. This year will start lidar measurements **(Del Guasta)** and in-situ optical measurements will improve. AOD measurements will be also improved.

Data from Specific Research Projects – TAVERN

AOD and sky-brightness measurements at Dome C

SP-7i sky-radiometer will be installed during this 2007-2008 summer campaign



Very large spectral interval. 18-19 channels: UV (308, 322, 340, 370 nm) – VIS-IR (410, 440, 500, 550, 670, 870, 940, 1050 nm) – IR (1250, 1550, 2060, 2140, 3300, 4000 nm).
FOV variable between 0.9 and 2 degree. Sky-diffuse irradiance in the Almucantar geometry. The version SP-6 is the basic instrument of Siberian network SIBRAD.

ISAC-CMDL photometer used 2006-2007

ISAC-CMDL photometer

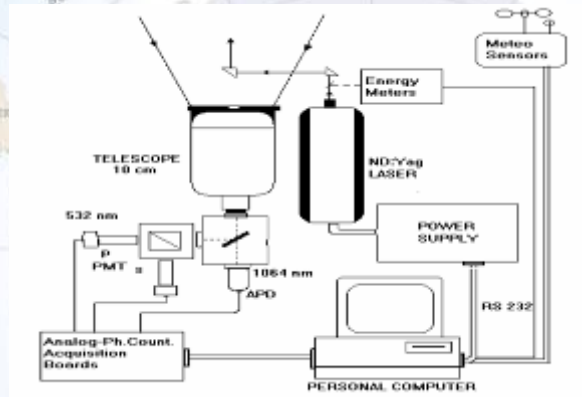
Based on the SP02 Carter-Scott photometer. very large FOV.
Eight wavelengths (368, 411, 500, 610, 675, 778, 862, 1050 nm).
Fully automated.
GPS, pressure and temperature sensors.
Campbell CR-10 data acquisi

Brest, December 11 2007

Data from Specific Research Projects – TAVERN

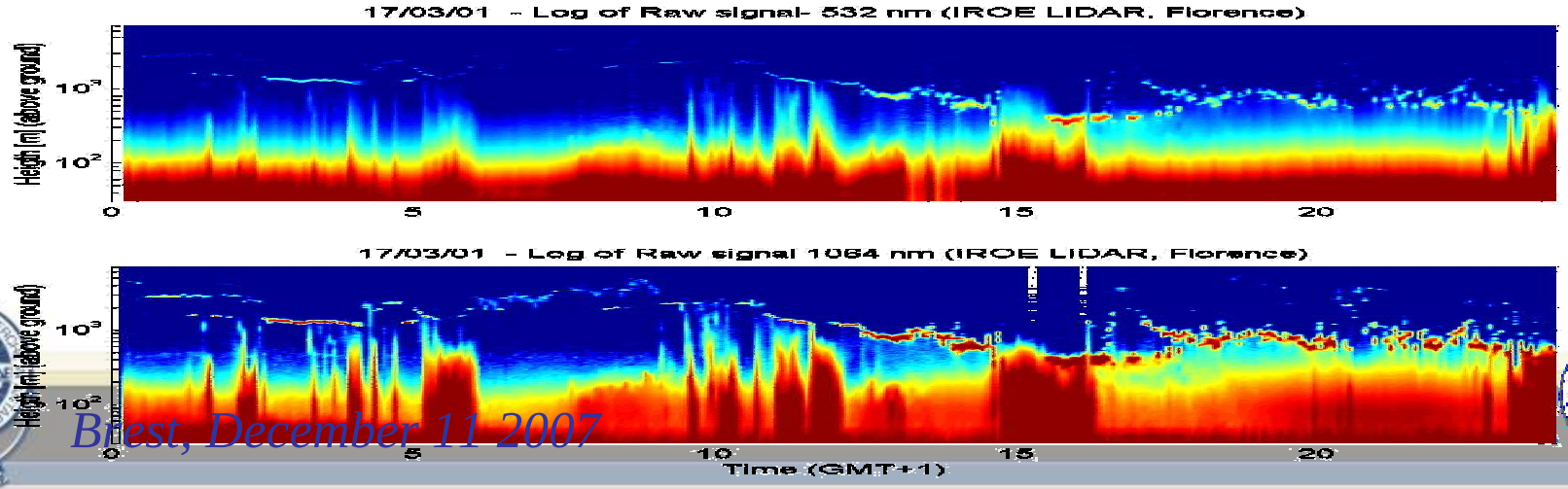
Automatic 532-1064 nm Backscatter LIDAR

An automatic 532-1064 nm LIDAR capable of 24h/day unattended operation will be installed during 2007-2008 summer campaign by IFAC-CNR **(Del Guasta)**. The system provides vertical profiles of aerosol backscatter and depolarization in the troposphere from 30-50 m above ground, with a height resolution of 7.5 m and a time resolution of a few minutes. Daily color plots (time-height-backscatter) are produced automatically.



LIDAR data applications:

(1) qualitative information on atmospheric vertical structure; (2) cloud height monitoring; (3) aerosol/cloud phase (liquid-solid); (4) Study of precipitation processes; (5) Tropospheric aerosol size/ mass estimation



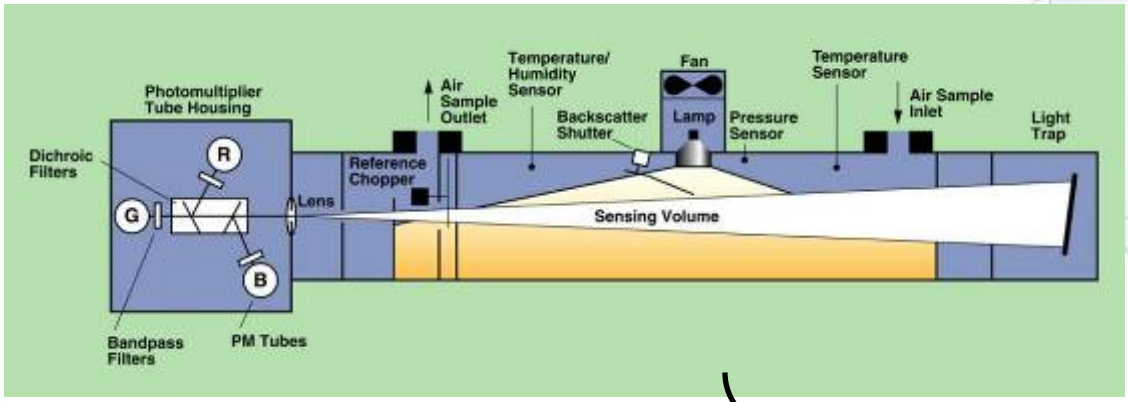
Brest, December 11 2007

Data from Specific Research Projects – TAVERN

In-situ optical measurements (Finnish contribution to TAVERN)

TSI 3563 Integrating Nephelometer
Total and backscattering coefficient
at λ = 450, 550, 700 nm

3 λ Particle Soot Absorption Photometer (PSAP)
Radiance Research, Absorption coefficient
at λ = 467, 530, 660 nm



Extinction coefficient &
Single-scattering albedo

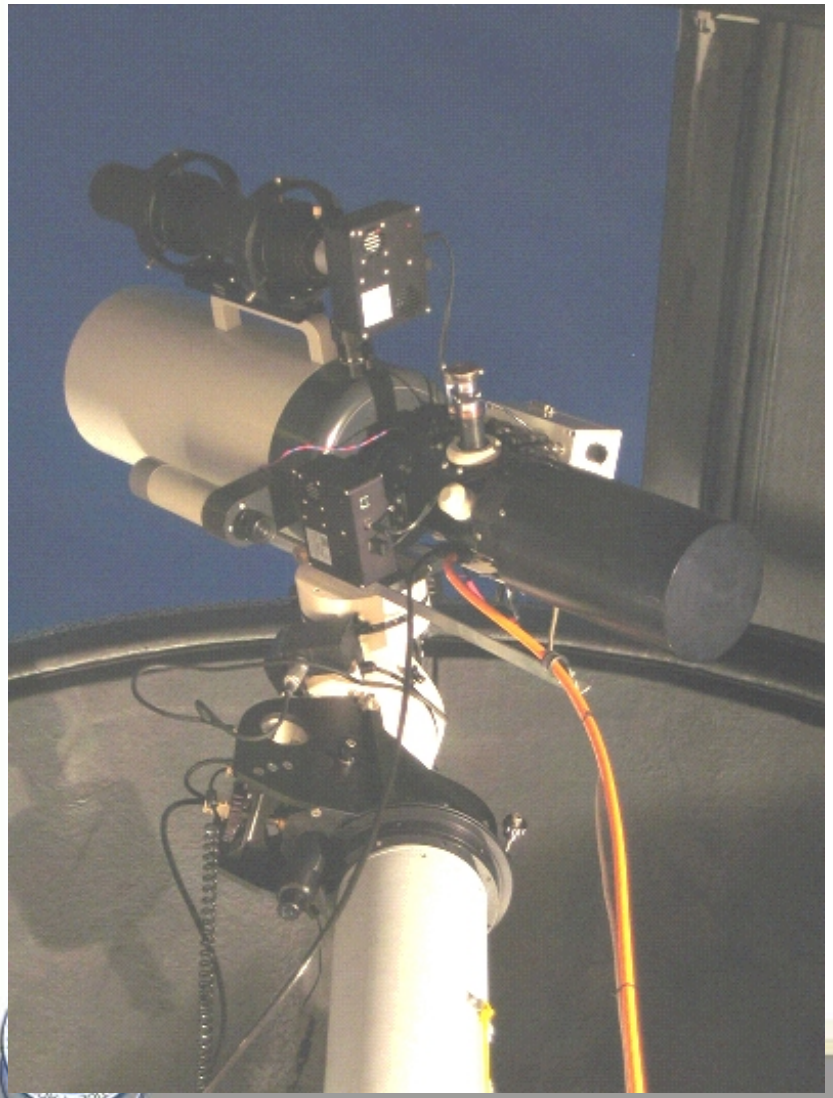
DMPS / later: Twin-DMPS
Number size distributions at D_p = 10 - 700 nm / 3 – 700 nm

Optical particle counter (e.g., Grimm)
Number size distributions at D_p = 0.3 – 20 µm

TSI CPC 3010
Number concentrations: Quality control of DMPS integrations, also a fast indication of contamination

Refractive index from chemical composition => with Mie calculations estimation of optical closure

Star-photometer measurements during polar night (German contribution to TAVERN)



- Succesful operation in the Arctic (Ny-Alesund, Spitzbergen) since 1996.
- In combination with LIDAR and Sun photometer year round observation of the aerosol variability over the plateau.
- Motivation is also the detection of tropospheric (ice crystal) aerosol events, including astronomical applications.
- The Operation is planned to start at Concordia in 2009. Radome is now traveling to Concordia through DDU.

The near future for Atmospheric physics at Concordia

- In april 2006 a first meeting to discuss a common strategy for Atmospheric Physics, glaciology and Astronomy was held in Rome
- For Atmospheric Physics and glacilogy the meeting produced a short summary of the planned research activities more the proposal for the Coordination activity COCOA
- In the last two years field activities improved considerably with installation of many new instruments, the buildings of a Chemistry and a Physical Shelter in the Clean Air area, the instrumentation in some extent of the 30 m tower etc.
- A new meeting is NECESSARY to discuss together the near-future strategies, logistical problems connected to the rapidly increse of field activities, harmonization of data, how to work in the perspective of the participation of other european research groups and activites, rules for the common use of the data collected etc.
- We propose to organize it no later May 2008, hopefully during March 2008 to be in time for the next campaign and we can offer to host it again in Italy (Bologna or Rome).

COCOA : a Proposal to the Concordia S.C.

- **COCOA: Common Concordia Observatory of the Atmosphere.**
- The basic idea of COCOA is to concentrate all the routine atmospheric instrumentation on the 30 m tower at Concordia (extended to 50 m(?)) in order to benefit of common, integrated measurements, and to optimize measurements and resources.
- Radiosoundings to be done twice a day as part of the RMO program.
- Proposals for new installations:
  - A new high resolution mini-sodar.
  - The 13 m tower will be equipped with new sensors: 3 ultrasonic anemometers and 4 temperature-RH probes.
  - 1 radiometer (microwave, to determine the temperature profile).
  - 1 radiometer (in the visible and infrared).
  - 1 lidar to measure the cloud cover.
  - 1 star-fotometer to measures the optical thickness during the winter too (TAVERN).
- Real Time from BSRN station (depending on the community's co-operation).

Thank You

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Brest, December 11 2007