

BLLAST RADIOSOUNDINGS

Operations - data - observations



METEO FRANCE
Toujours un temps d'avance

UC DAVIS
UNIVERSITY OF CALIFORNIA



D. Legain, S. Derrien, S. Tzanos,

J. Mione,

I. Faloona,

F. Lohou,

F. Couvreur,

M. Lothon, F. Guichard,

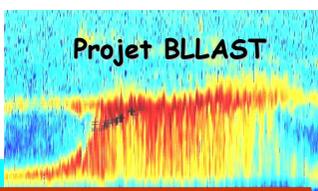
C. Darbieu, L. Kergoat,

J. Cuxart,

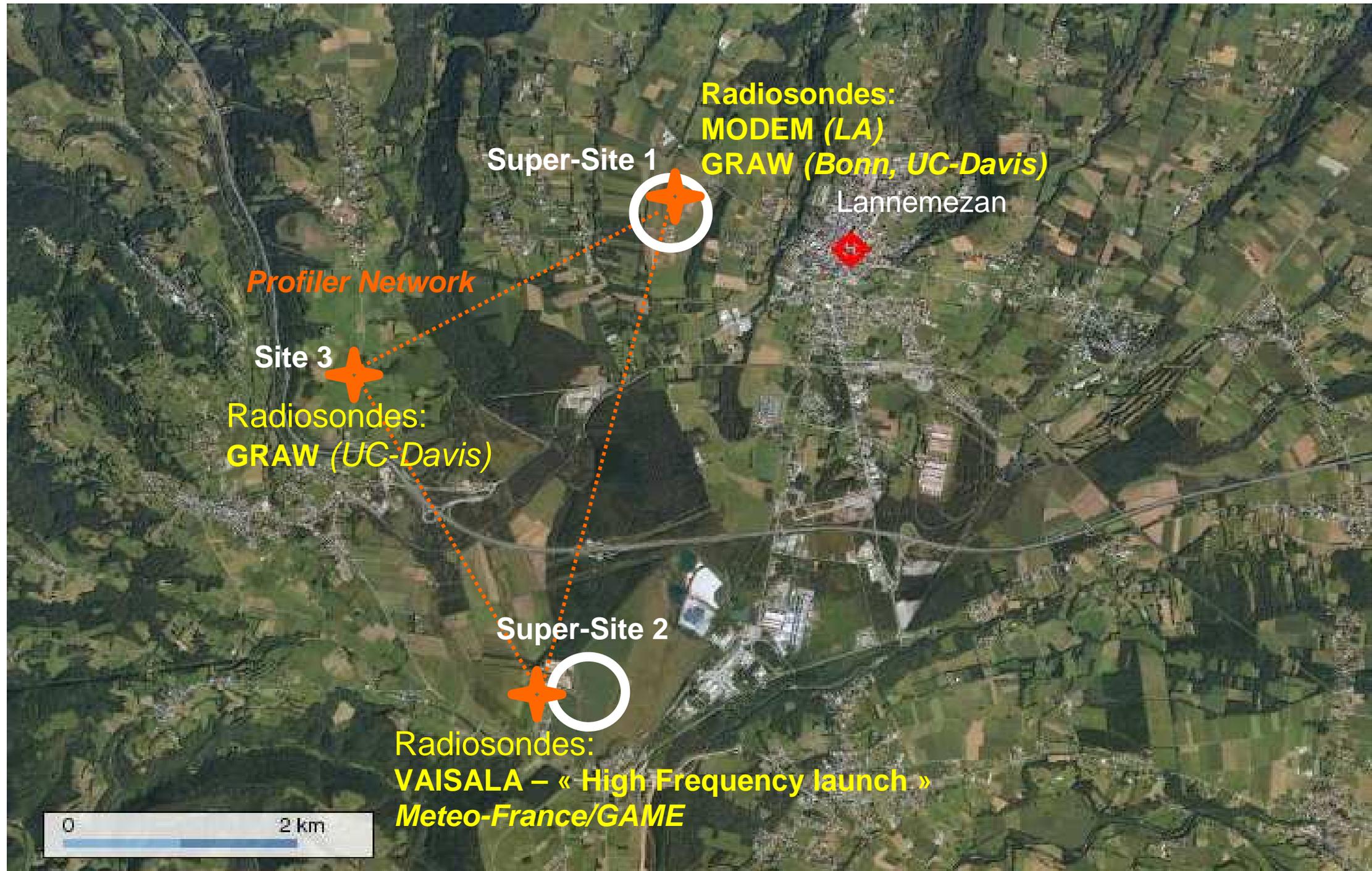
M. Sastre, C. Roman,

Gerrit Mascwhitz and students from Bonn

OUTLINE



- Reminder of the launching sites and stations
- Outcome of the operations
- Summary of all soundings made
- Overview of the observed vertical structures

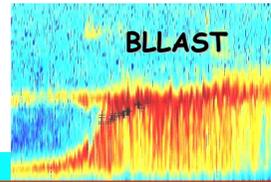


Standard radiosoundings



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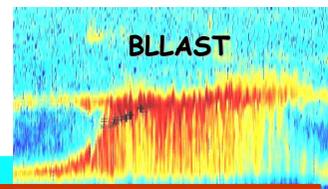
universität**bonn**
Rheinische
Friedrich-Wilhelms-
Universität Bonn



- MODEM: Laboratoire d'Aérodologie, GRAW: Bonn and UC-Davis
Operators : many of you !
- Most of the balloons launched from Site 1: 592 m
(MODEM and GRAW radiosondes)
- A few from Site 3: 578 m
(GRAW radiosondes)
- Total of 80 soundings



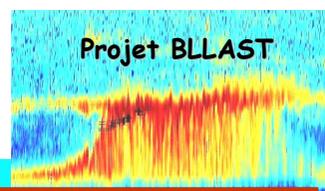
High Frequency Radiosounding system at site 2



- Operated by Météo-France/GAME/GMEI
- VAISALA radiosondes + release/retrieval technique
- Frequent soundings of the low troposphere ($z < 2\text{km}$)
- Allows the re-use of the probe
 - Retrieval rate of 80%(+)
 - Total of 65 soundings made with 20 probes



DATA BASE



- All soundings are now available on the database
- Reference altitude corrected for *GRAW* and *MODEM* (see *.ref) soundings
- *MODEM*: « raw » data (*.cor) and filtered data over height (*.fil)
- Other formal details

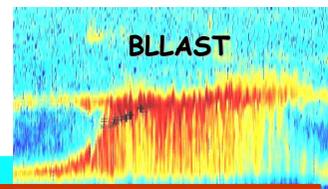
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	14/06/11	15/06/11	19/06/11	20/06/11	21/06/11	24/06/11	25/06/11	26/06/11	27/06/11	30/06/11	01/07/11	02/07/11	03/07/11	04/07/11	05/07/11	06/07/11		
S T A N D A R D	SITE 1:	4h15 5h15 6h15 7h15 8h15 9h30 10h30 11h15	8h15	5h21	5h15	5h09		05h00	5h00	5h03		1h24 7h31	1h54 5h01 4h47		0h21 4h48 7h38	1h16		
S T A N D A R D	SITE 3:																	
H F	SITE 2:	14:40	12:55 14:10 15:22	13:00 13:58 14:58 16:16 17:14 18:00 18:58 20:00	12:56 14:02 15:01 16:05 17:09 18:01 19:01													

MODEM-LA : 42 soundings
GRAW-UC Davis : 22 soundings
GRAW-Bonn : 15 soundings
VAISALA-GAME : 62 soundings

Time indicated is launching time

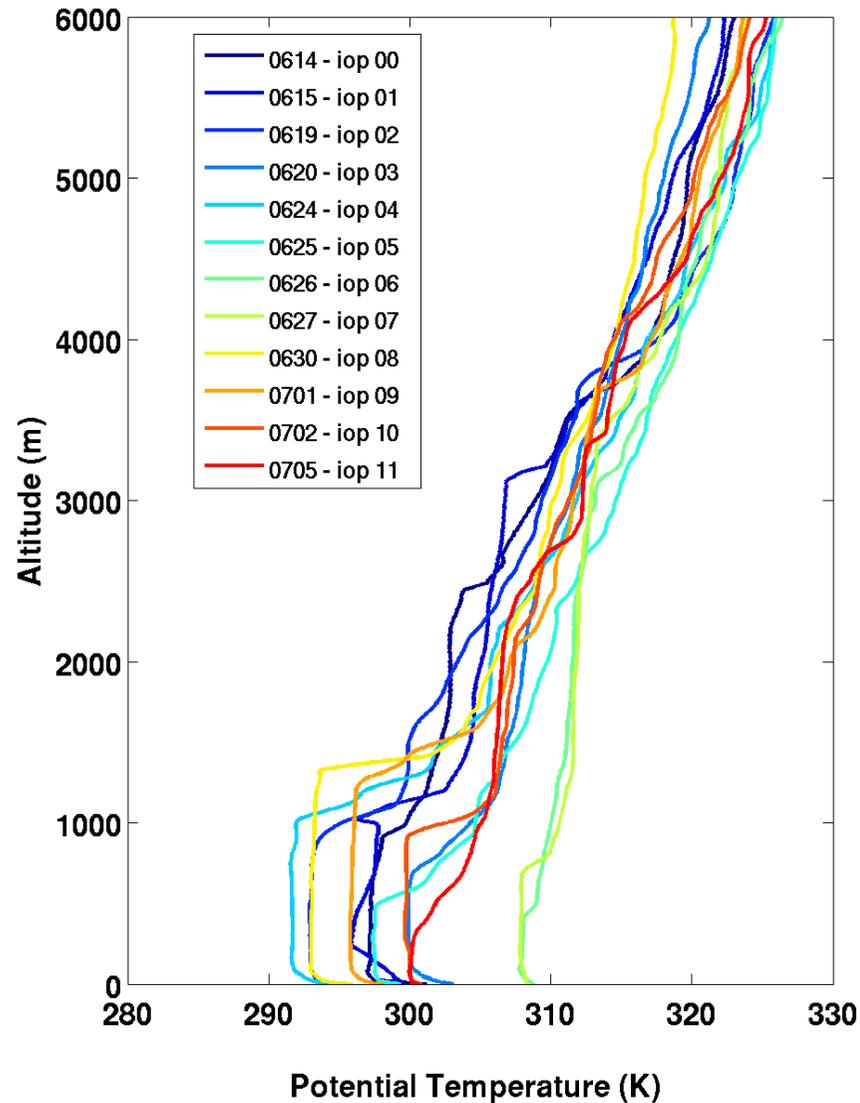
* three simultaneous launches on sites 1, 2, 3

Overview of the IOPs - all soundings at 1100 UTC

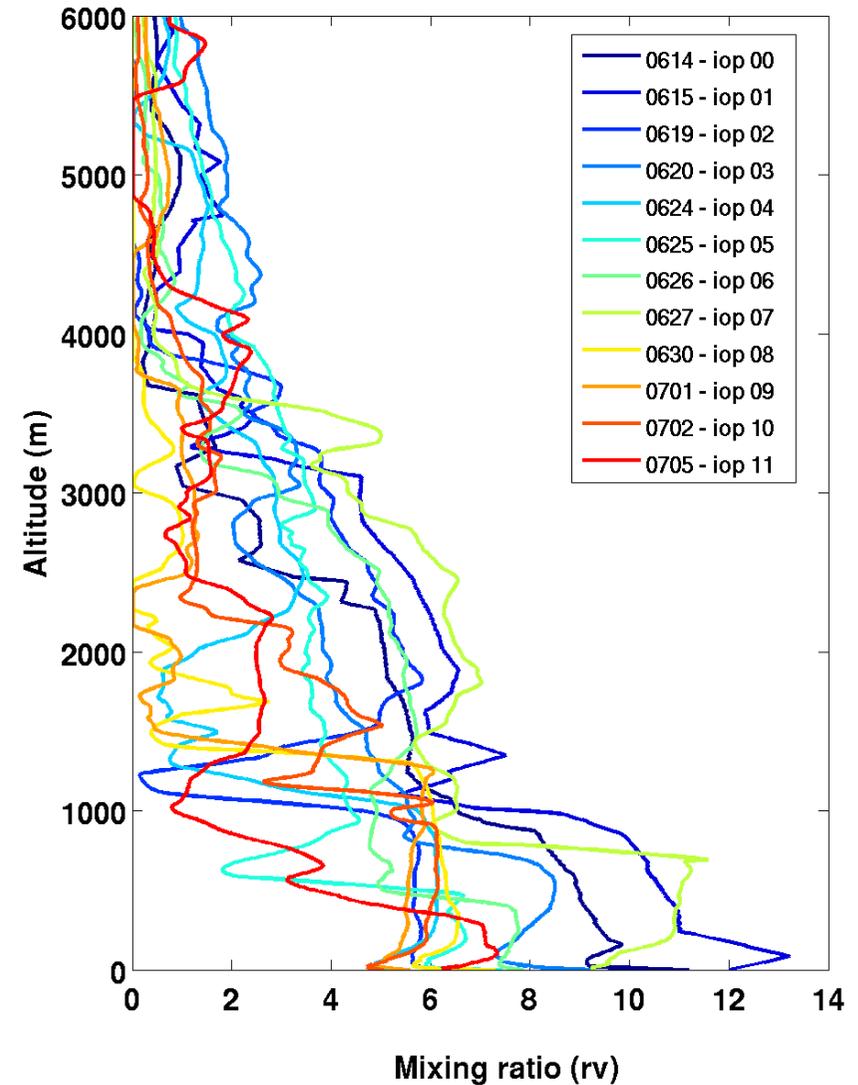


GRAW-Bonn and MODEM radiosondes

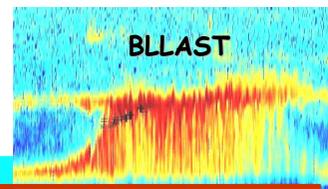
Potential temperature



water vapour mixing ratio

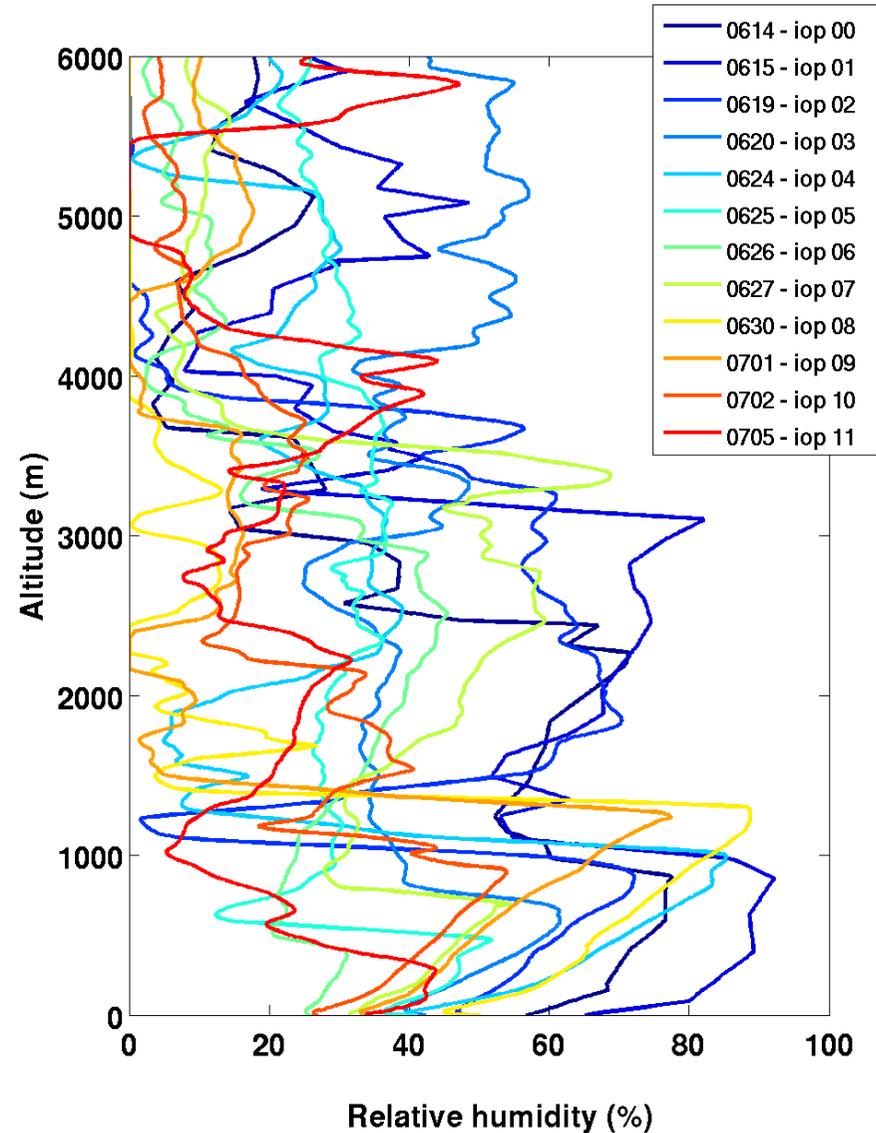


Overview of the IOPs - all soundings at 1100 UTC

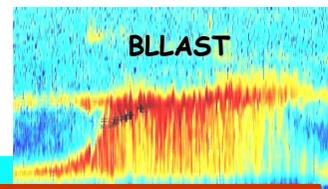


GRAW-Bonn and MODEM radiosondes

Relative humidity

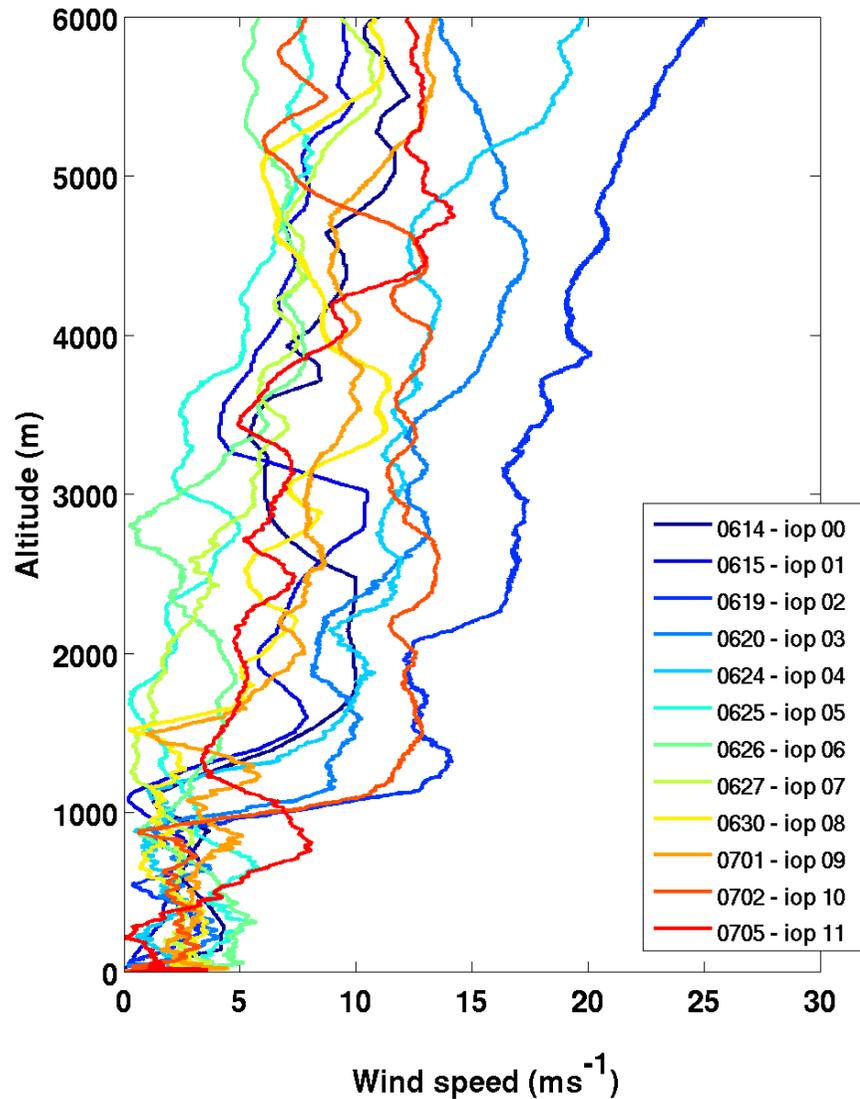


Overview of the IOPs - all soundings at 1100 UTC

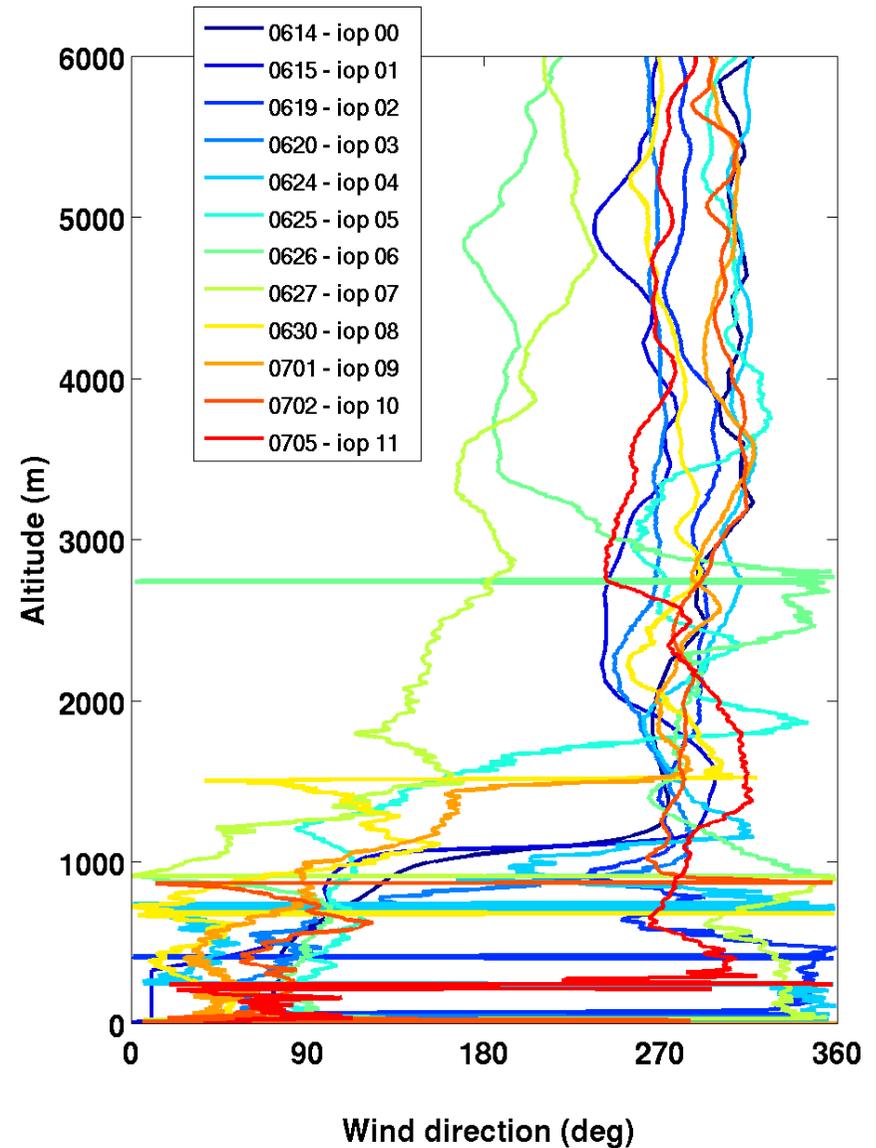


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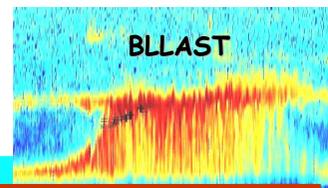
Horizontal Wind speed



Wind direction



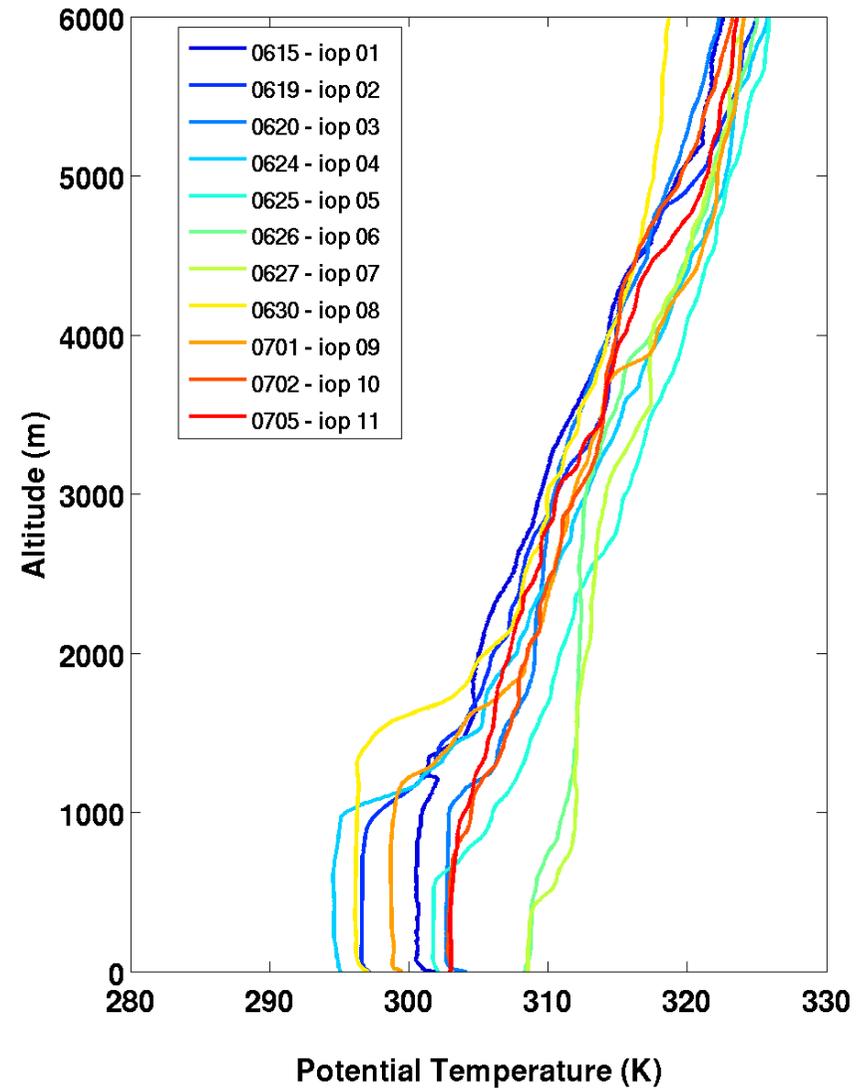
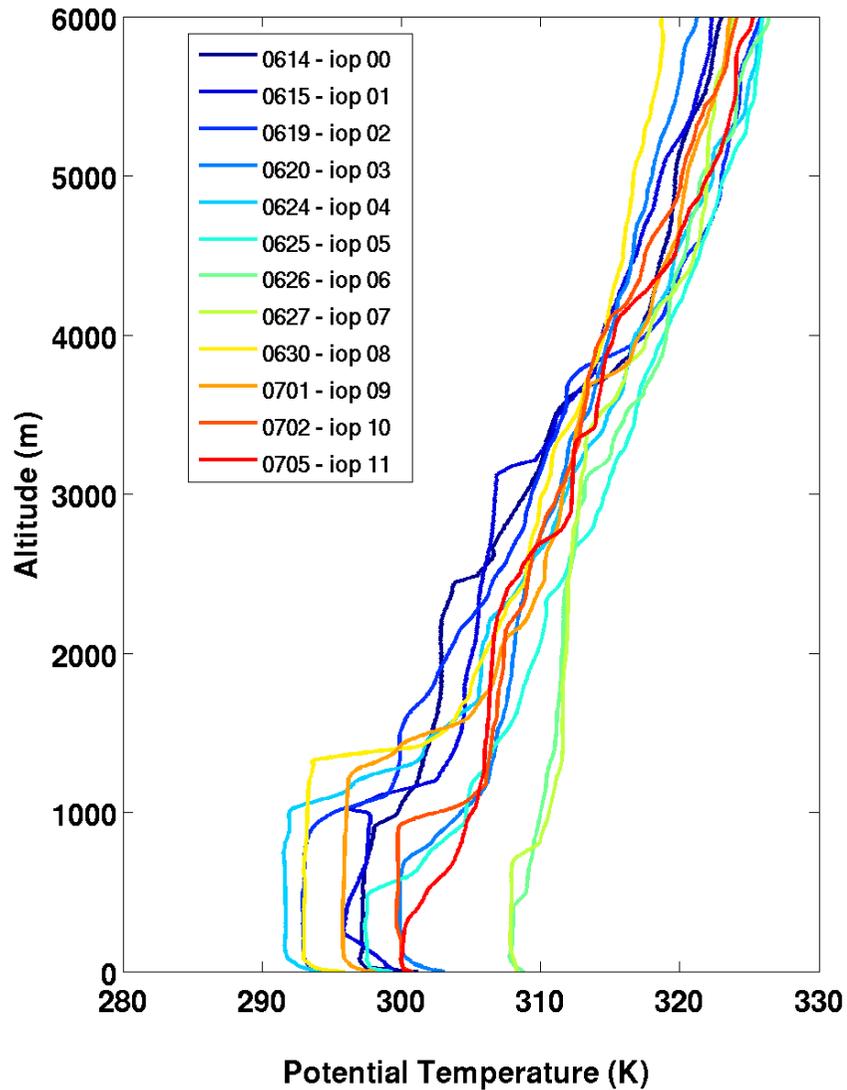
Overview of the IOPs - 1100 UTC to 1700



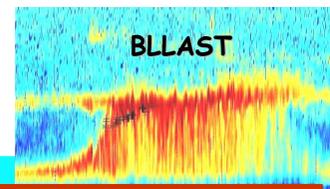
Potential temperature

1100 UTC

1700 UTC



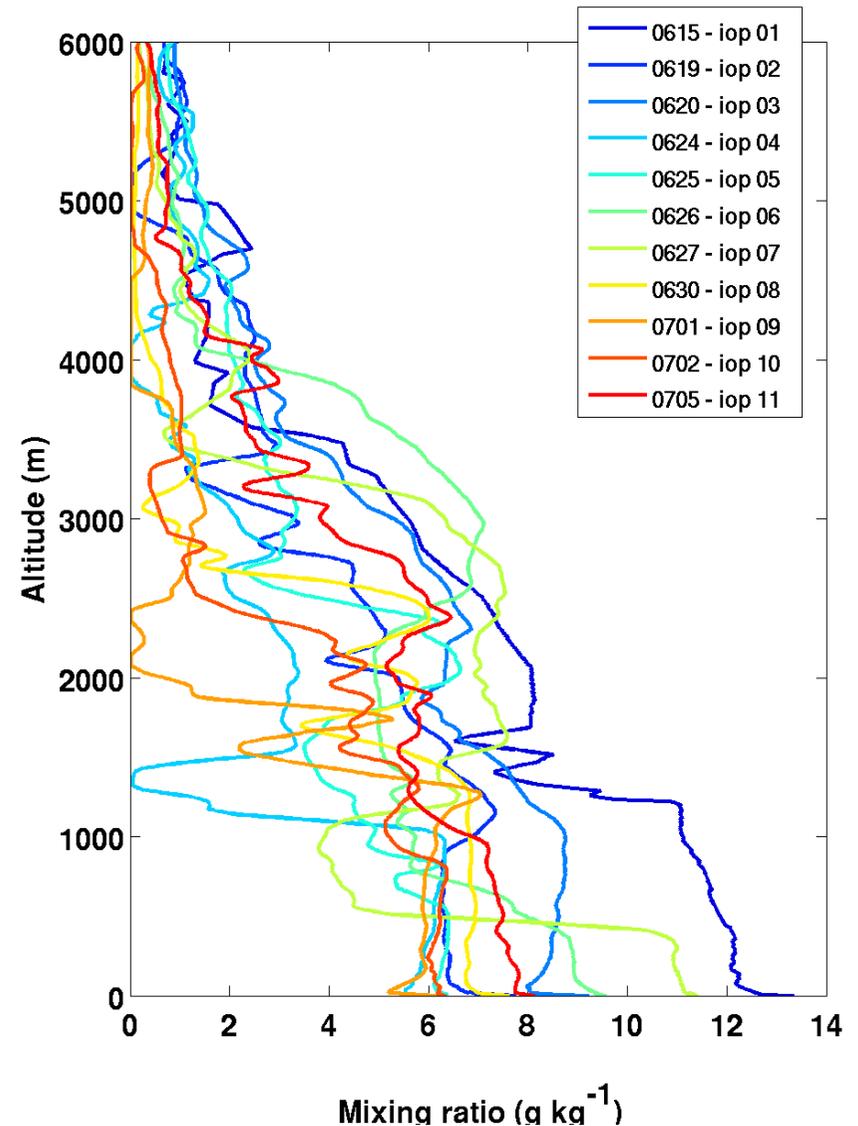
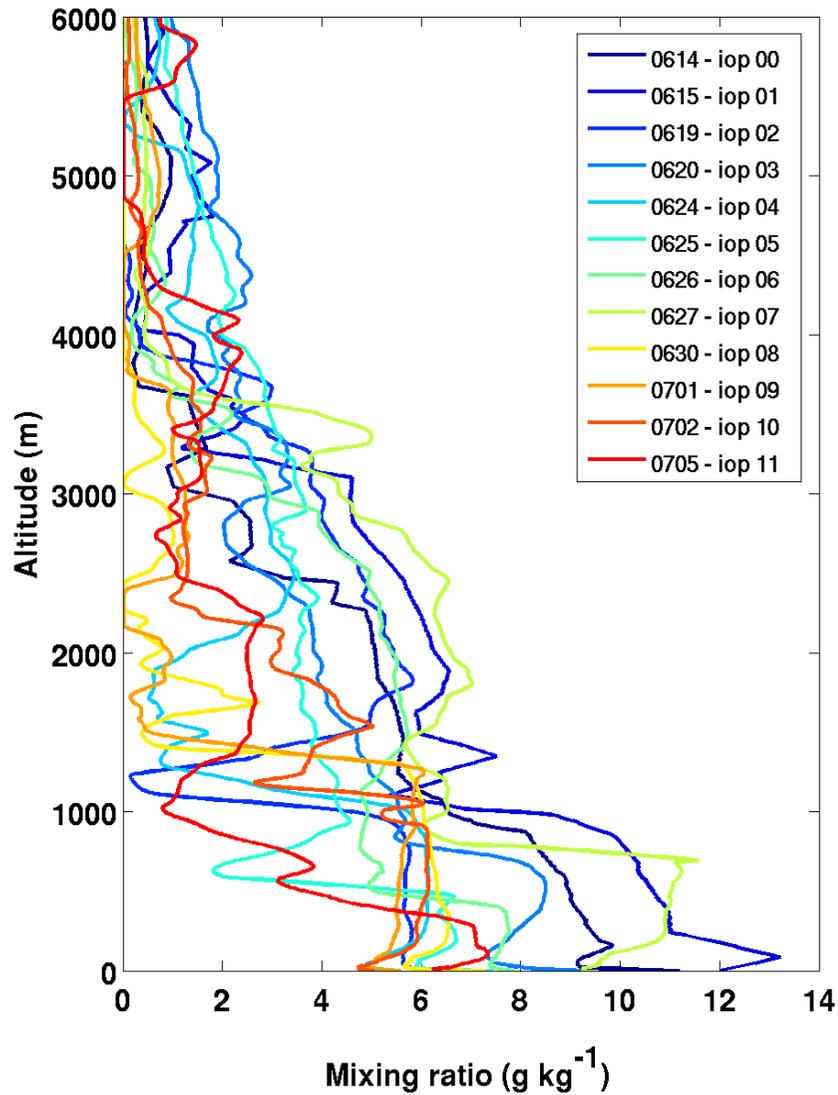
Overview of the IOPs - 1100 UTC to 1700 UTC



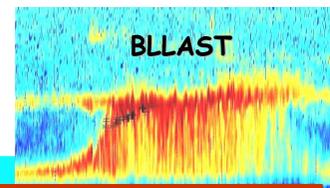
Water vapour mixing ratio

1100 UTC

1700 UTC

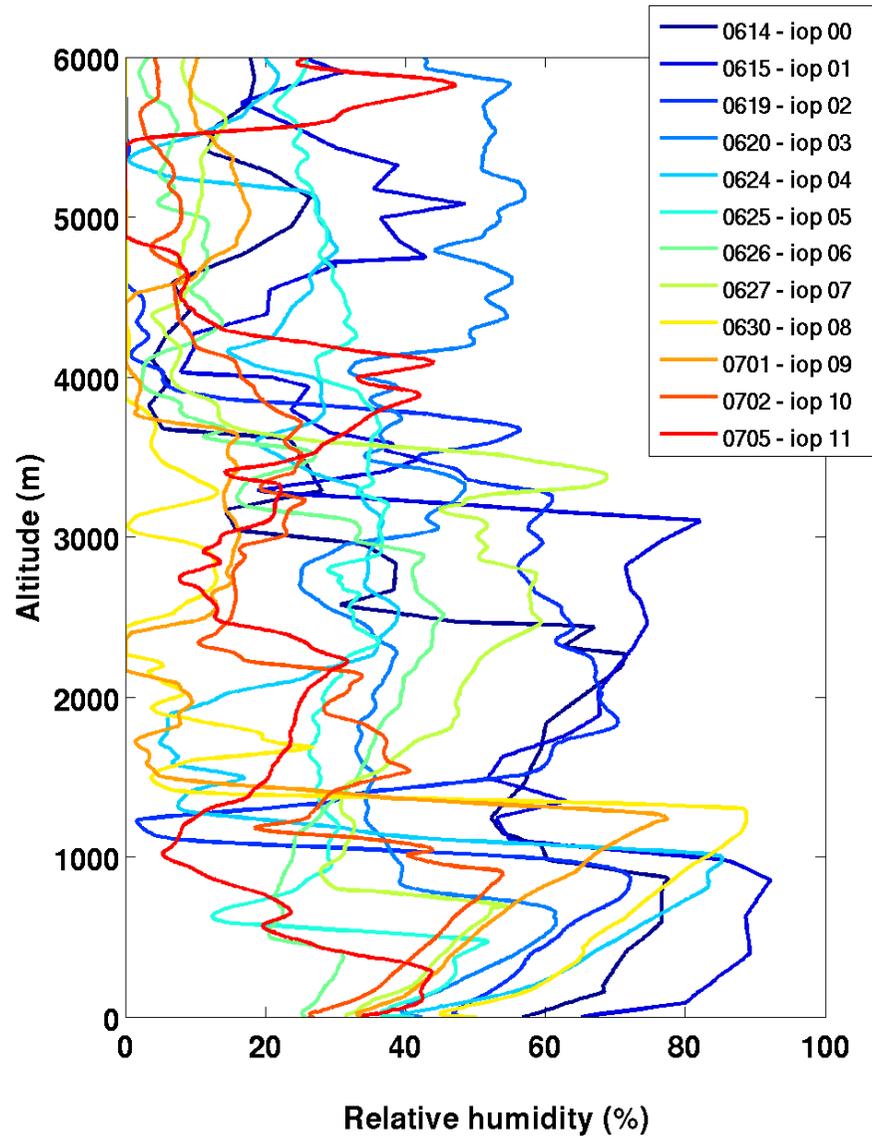


Overview of the IOPs - 1100 UTC to 1700

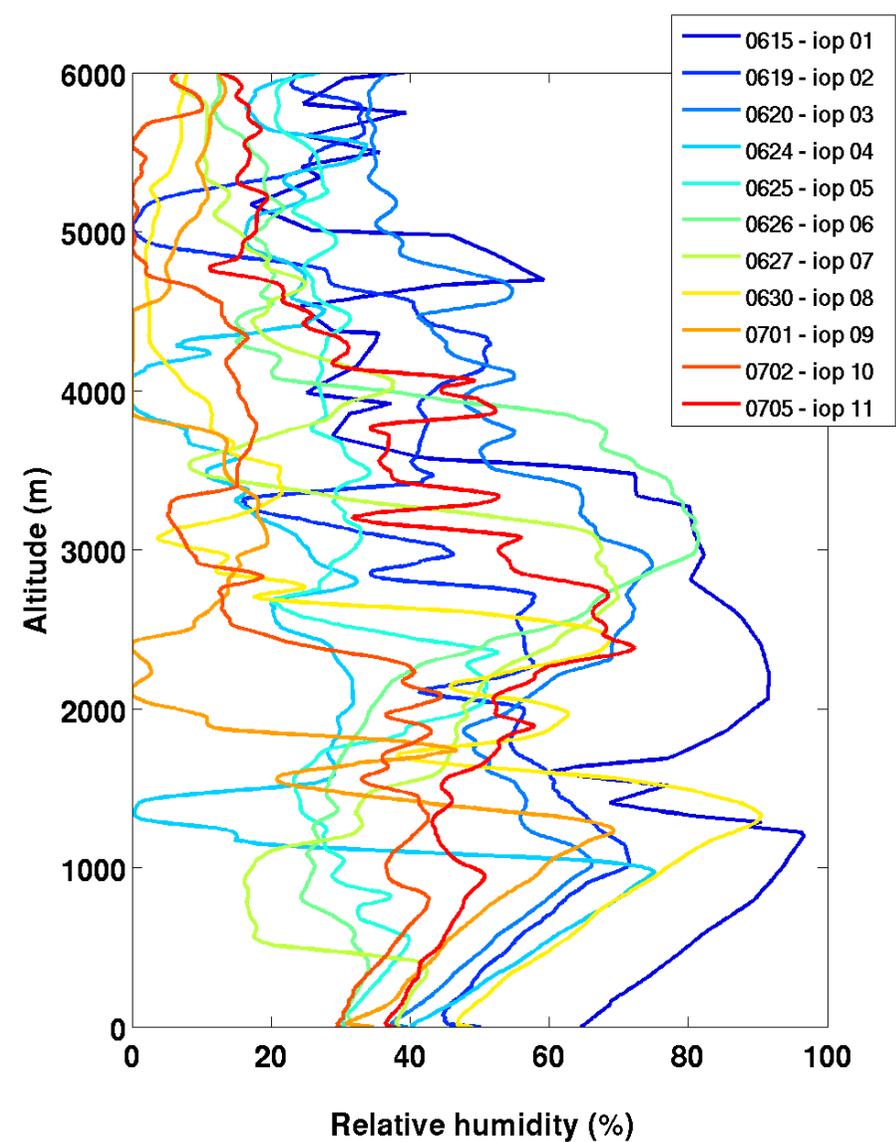


Relative humidity

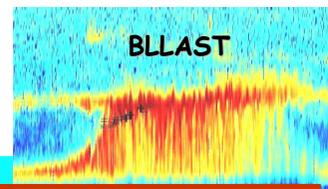
1100 UTC



1700 UTC



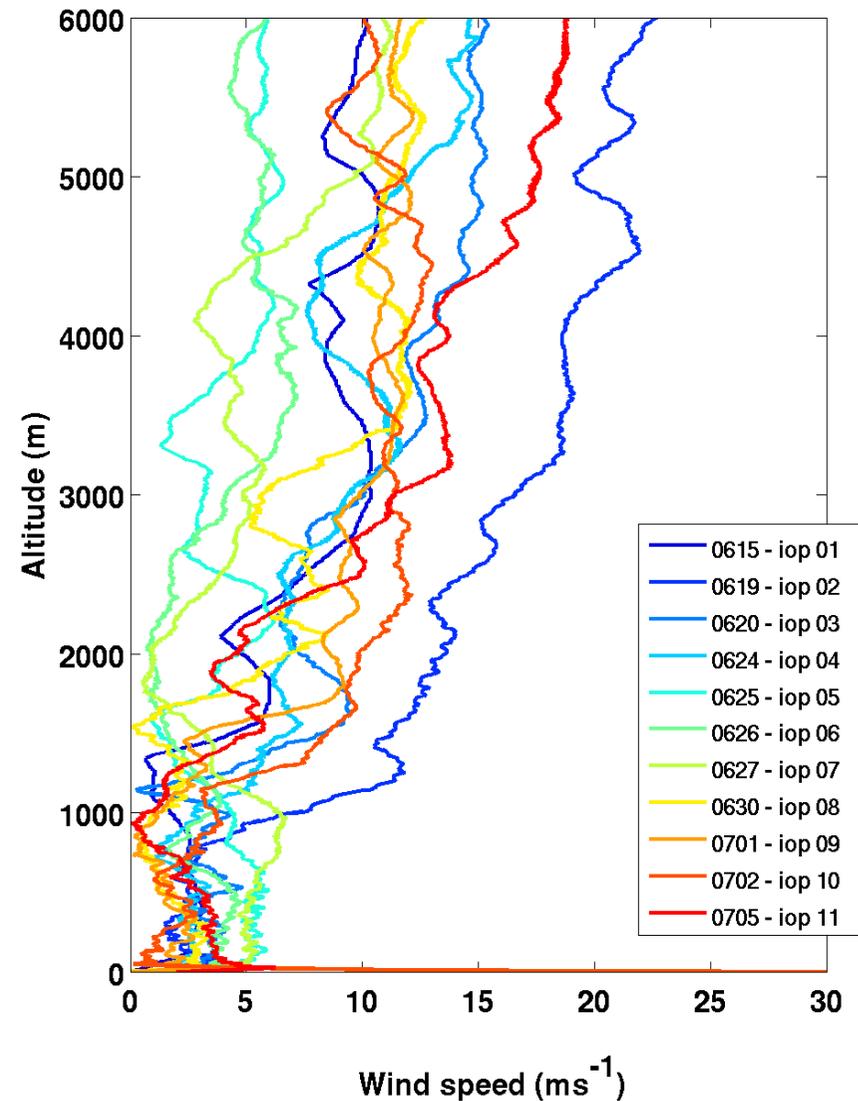
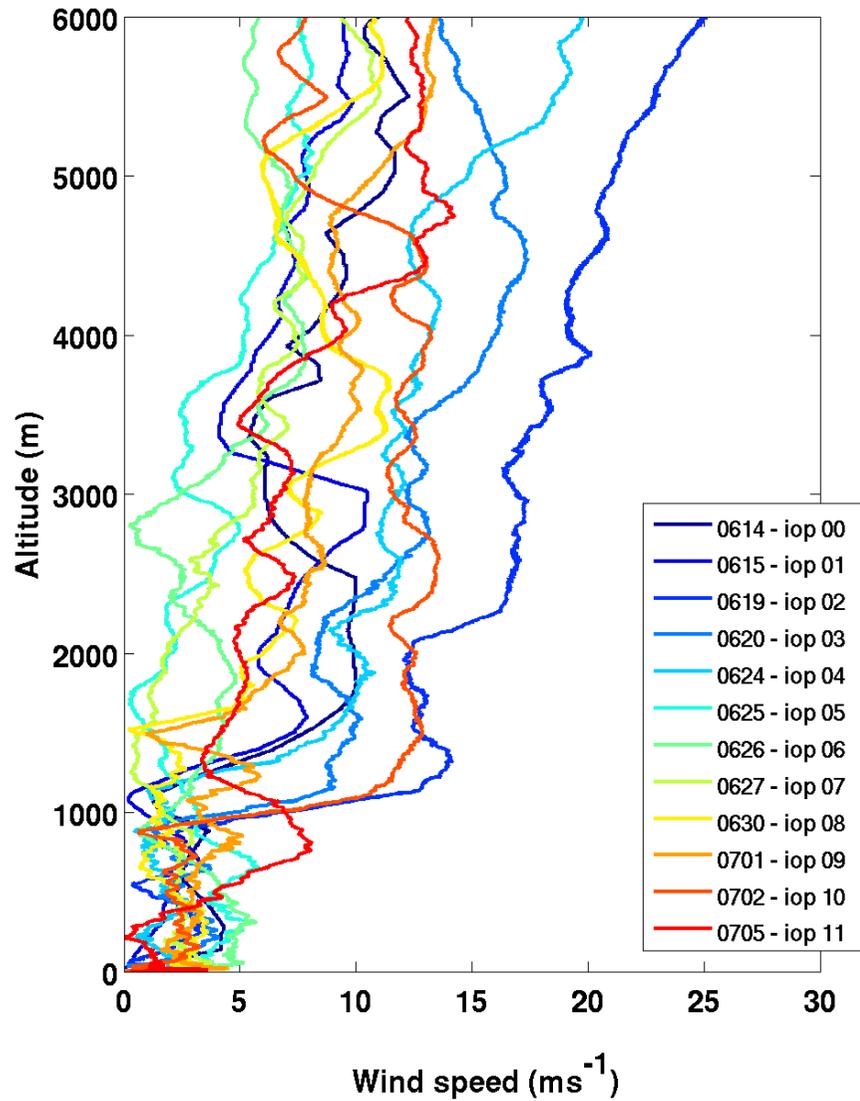
Overview of the IOPs - 1100 UTC to 1700 UTC



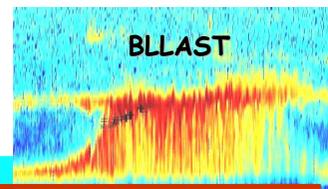
Wind speed

1100 UTC

1700 UTC

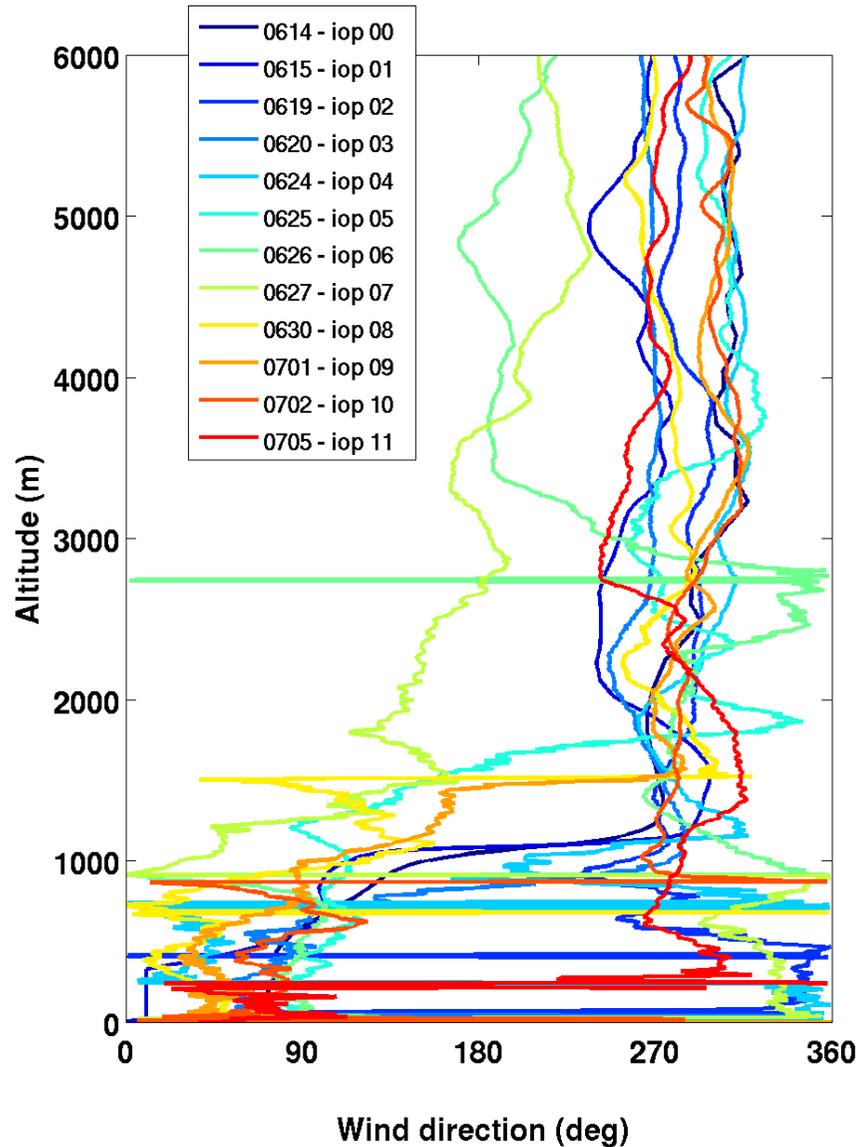


Overview of the IOPs - 1100 UTC to 1700 UTC

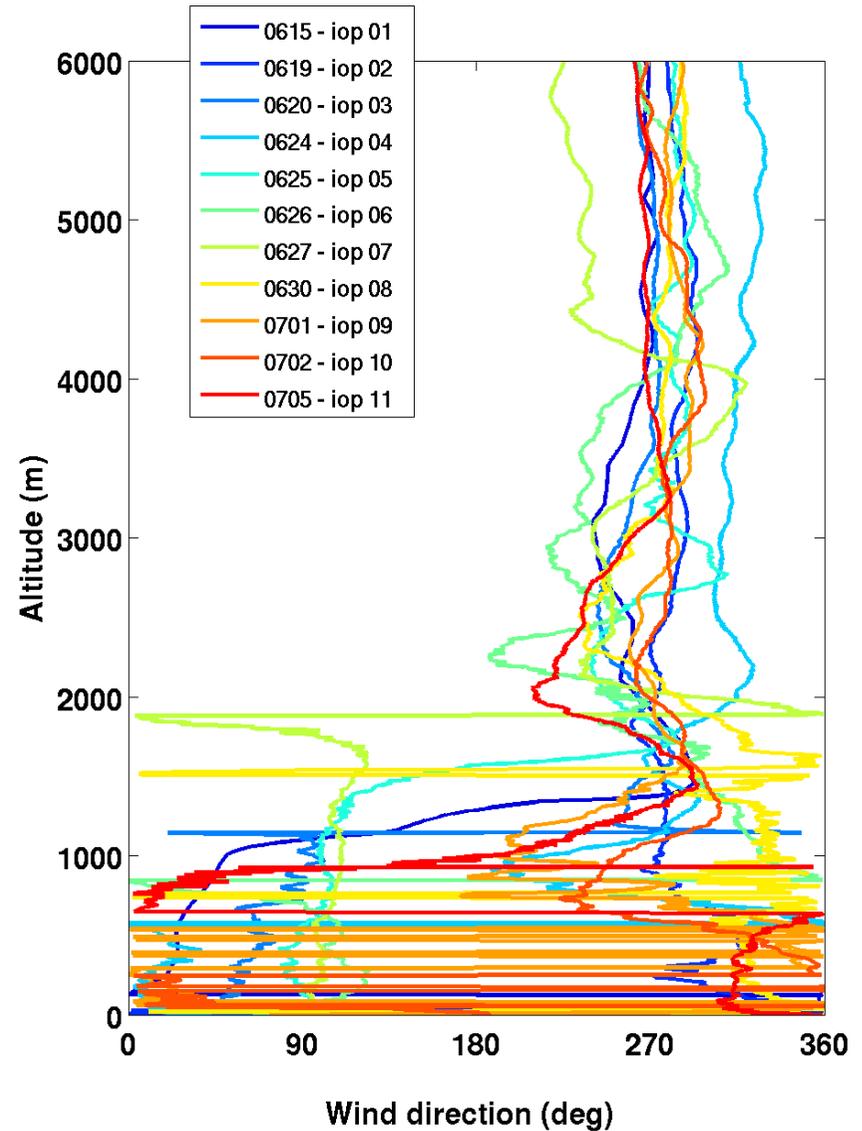


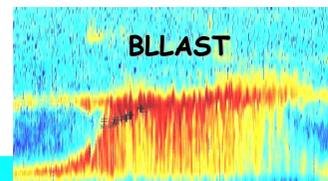
Wind direction

1100 UTC



1700 UTC





	TOP0	TOP1	TOP2	TOP3	21/06/11	TOP4	TOP5	TOP6	TOP7	TOP8	TOP9	TOP10	03/07/11	04/07/11	TOP11	06/07/11	
S T A N D A R D	SITE 1:	4h15 5h15 6h15 7h15 8h15 9h30 10h30 11h15	15/06/11 8h15 11h15 12h55 14h15 17h15 20h15 23h15	19/06/11 5h21 11h15 17h50 23h16	20/06/11 5h15 11h15 17h16 23h15	21/06/11 5h09	24/06/11 11h01	25/06/11 05h00 <u>11h00-11h00</u> 17h00 23h00	26/06/11 5h00 11h00 14h08 17h00* 20h00 23h00	27/06/11 5h03 11h01 14h00* 17h00* 20h00 23h00	30/06/11 11h00 17h00 20h15 23h13	01/07/11 1h24 7h31 11h00 14h06 16h58 20h01 22h54	02/07/11 1h54 5h01 10h57 14h06 16h55 20h27 23h08	03/07/11 1h51 4h47	04/07/11 21h07	05/07/11 0h21 4h48 7h38 10h53 13h00* 15h01* 17h01* 23h01	06/07/11 1h16
	S T A N D A R D	SITE 3:															
										14h00*	17h00*						
																	13h00* 15h00* 17h00*
H F	SITE 2:	14:40	12:55 14:10 15:22 16:47 18:13 19:05	13:00 13:58 14:58 16:16 17:14 18:00 18:58 20:00	12:56 14:02 15:01 16:05 17:09 18:01 19:01		13:00 14:10 15:02 16:00 17:08 18:00 19:00 20:00	12:30 14:08 15:30 17:00* 18:30 20:08	14:00* 17:00*		13:00 14:00 15:00 16:28 17:00 18:00 18:59 20:00	12:59 13:59 15:00 16:00 17:00 18:00 19:00 19:57			13:00* 13:58 15:00* 15:57 16:59* 17:59 19:01 19:57		

73 launched on site 1

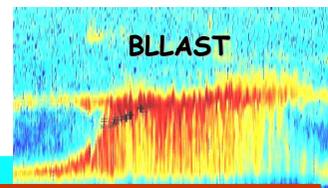
6 launched on site 3

62 launched on site 2

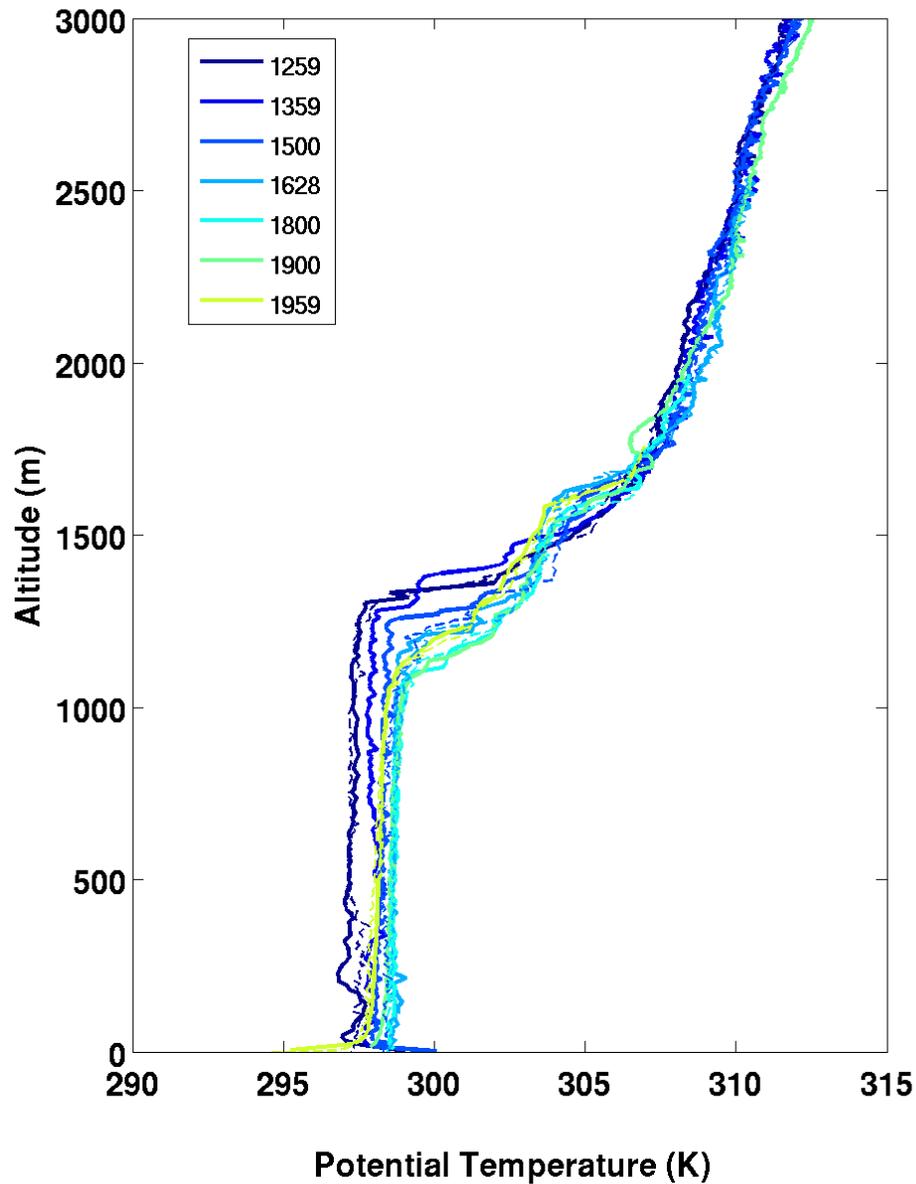
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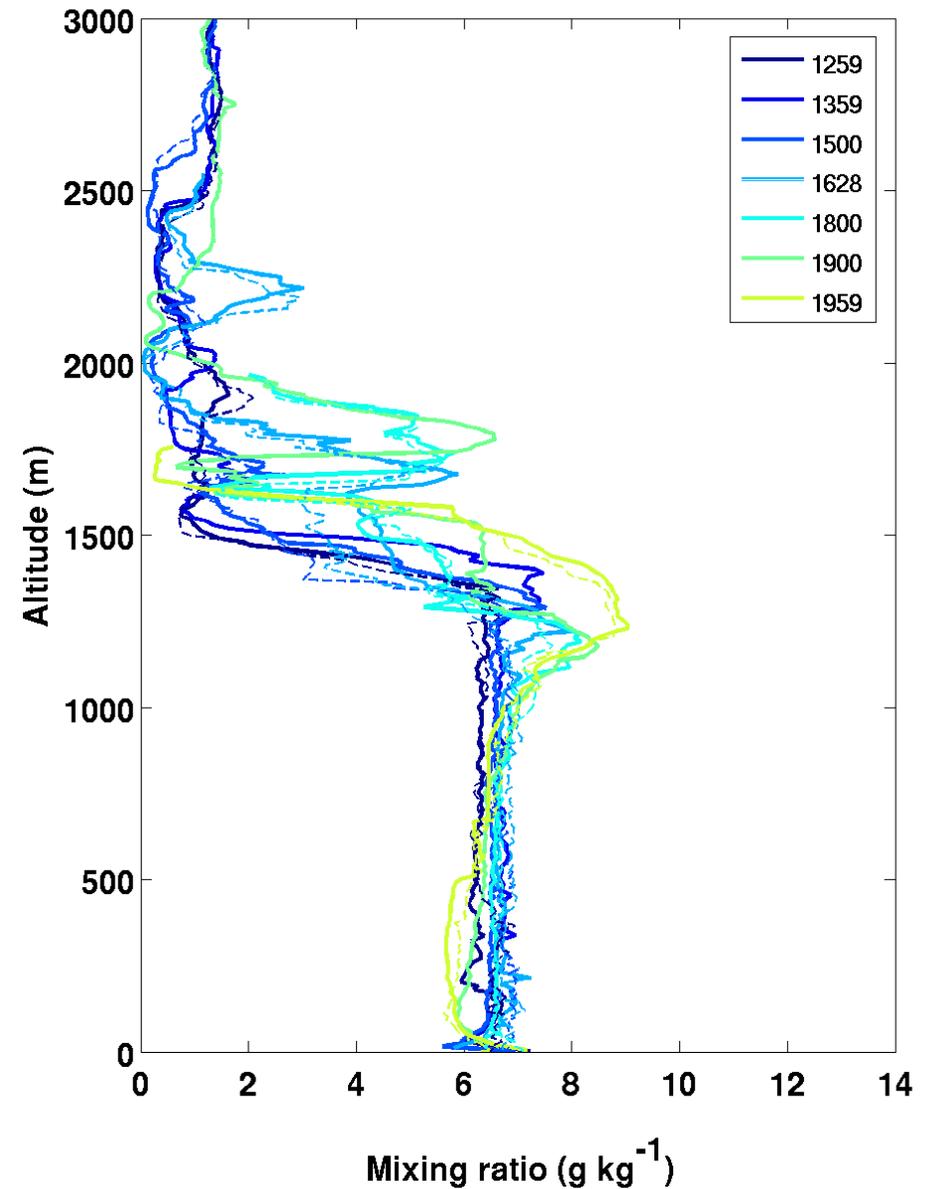
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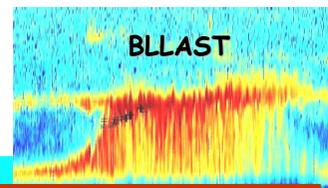


Potential temperature

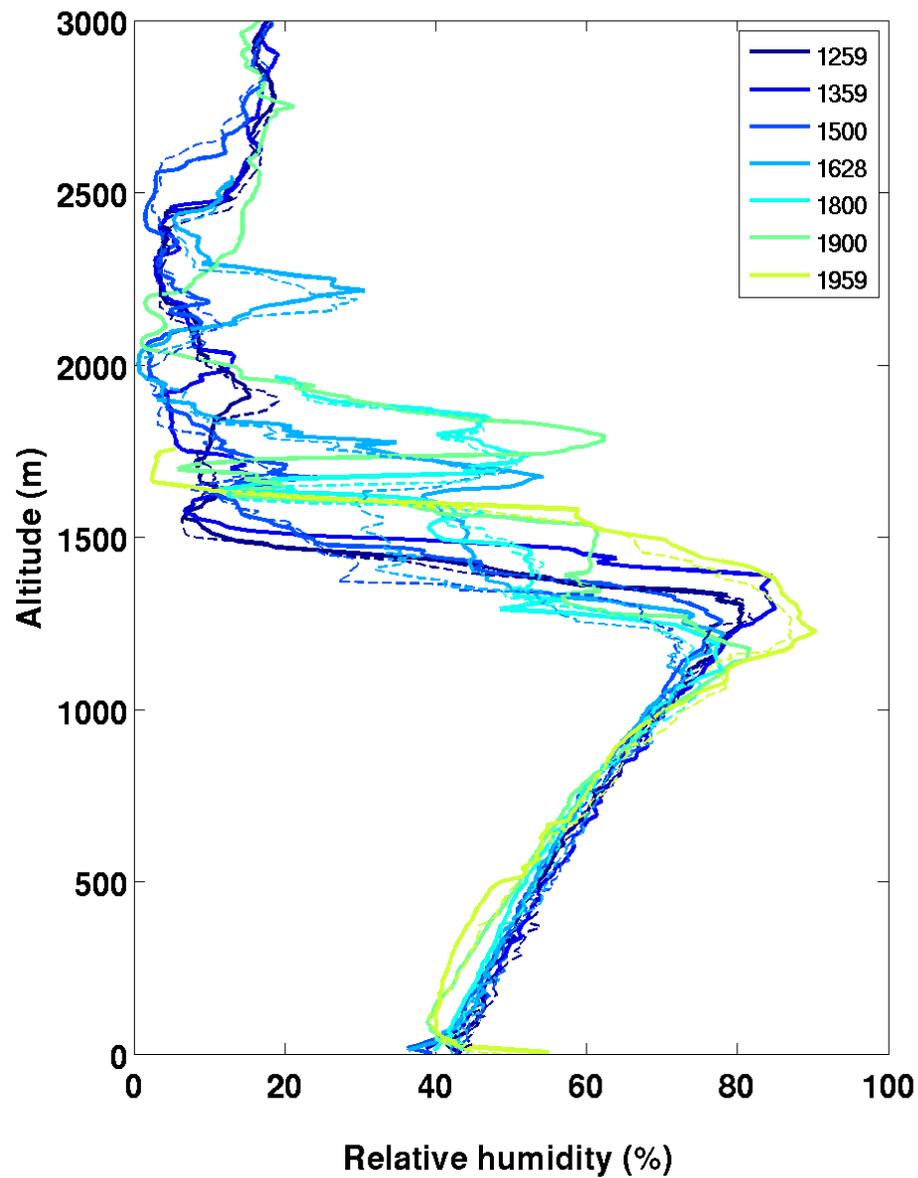


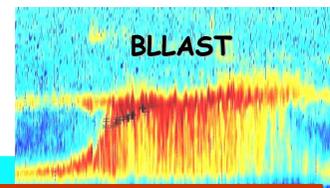
water vapour mixing ratio



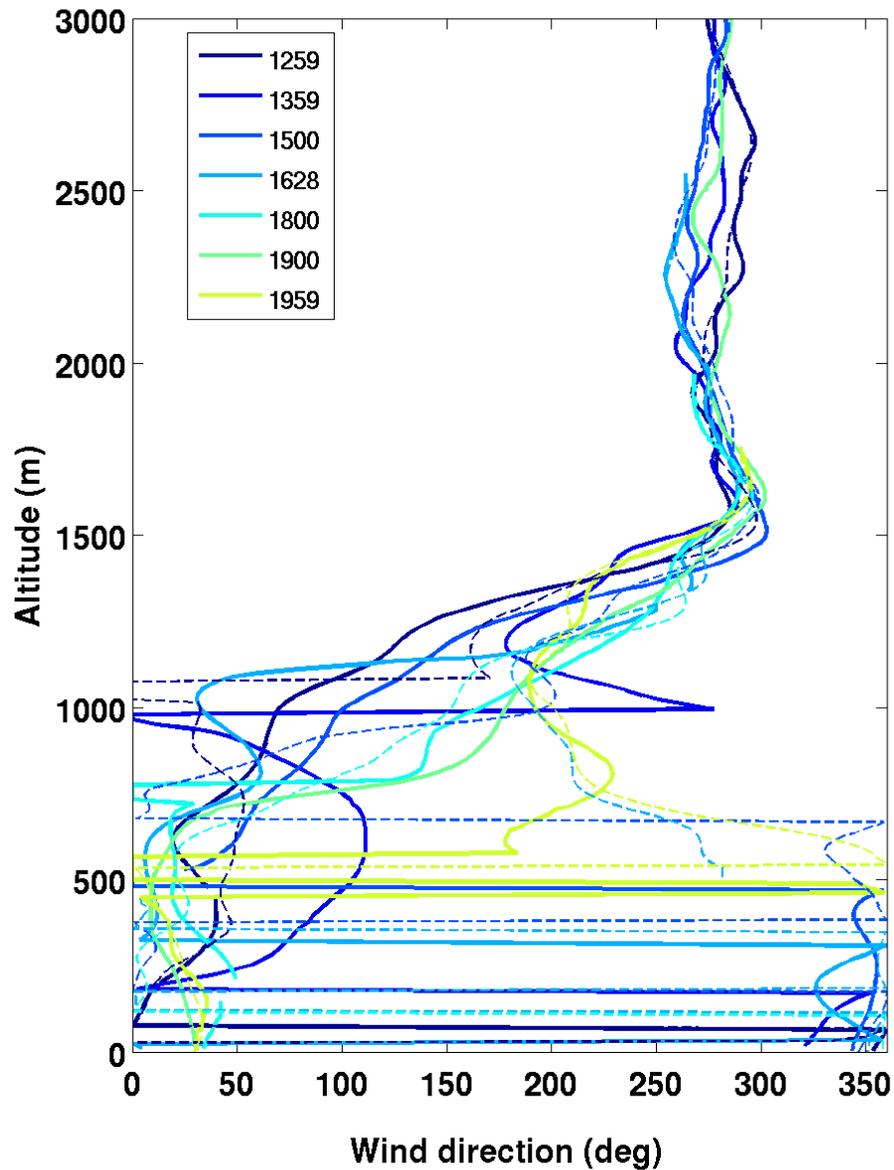


Relative humidity

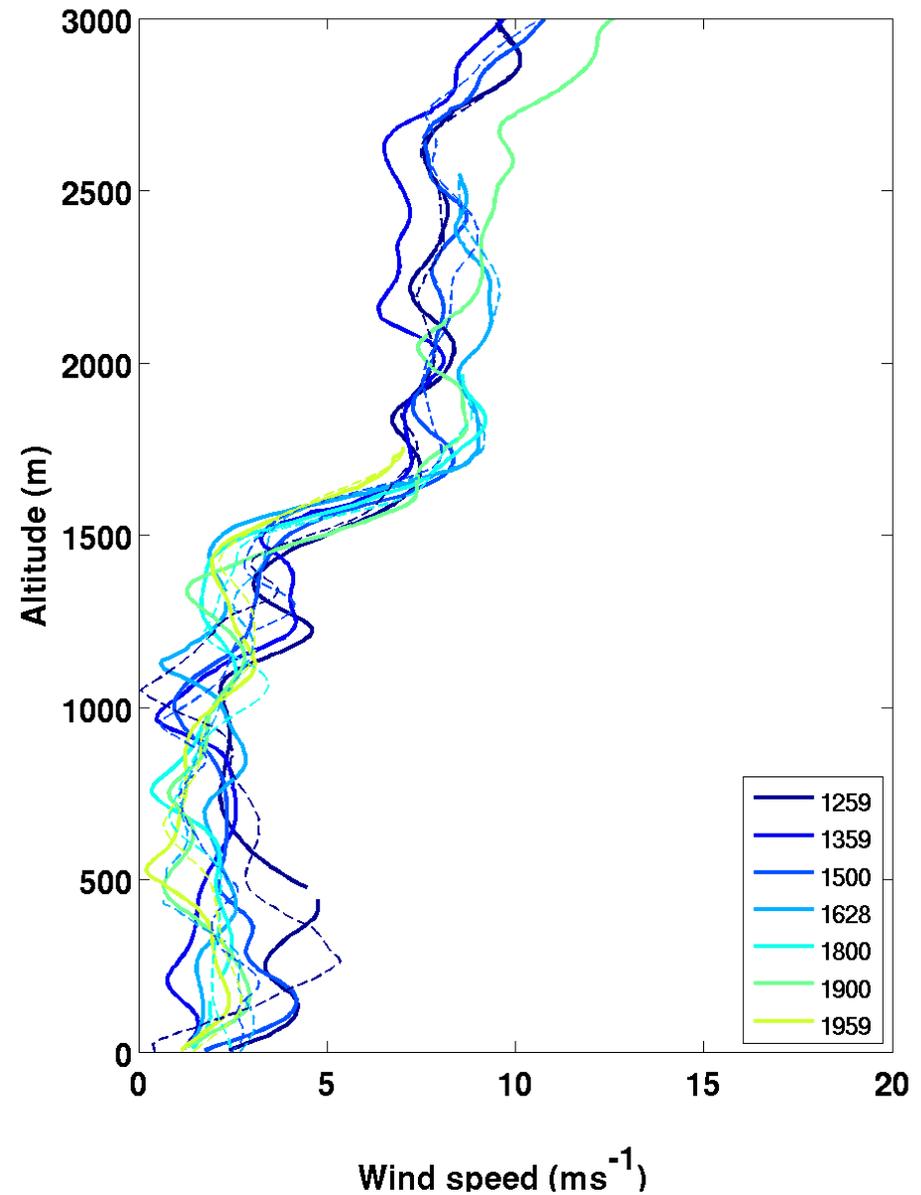




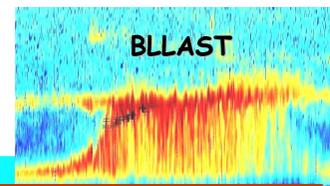
Wind direction



Wind speed

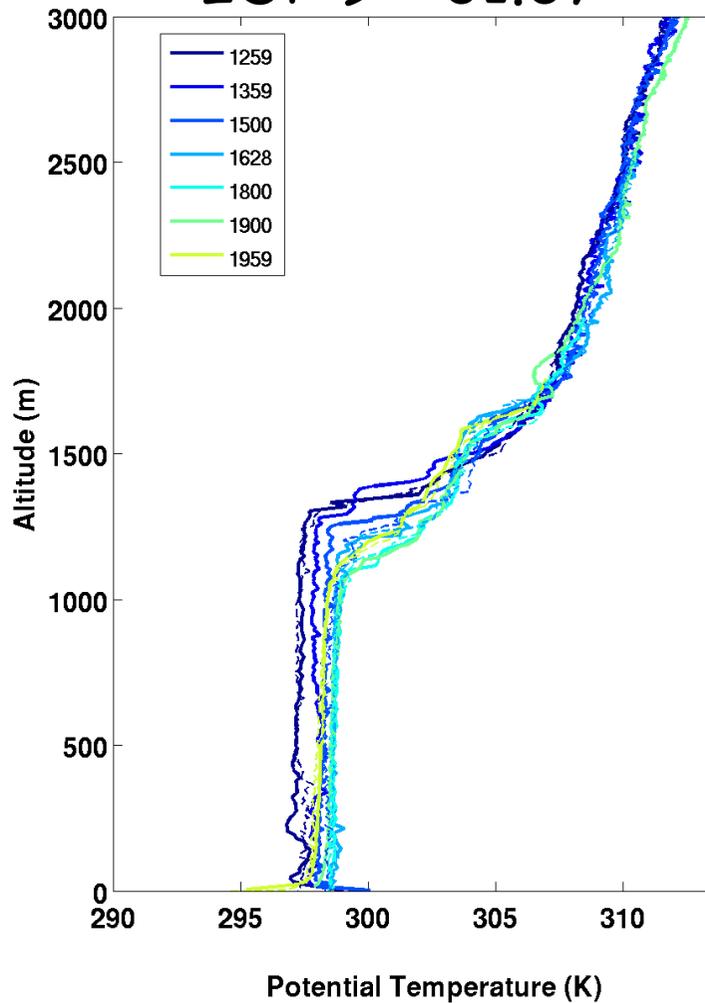


Various evolution of the vertical structure

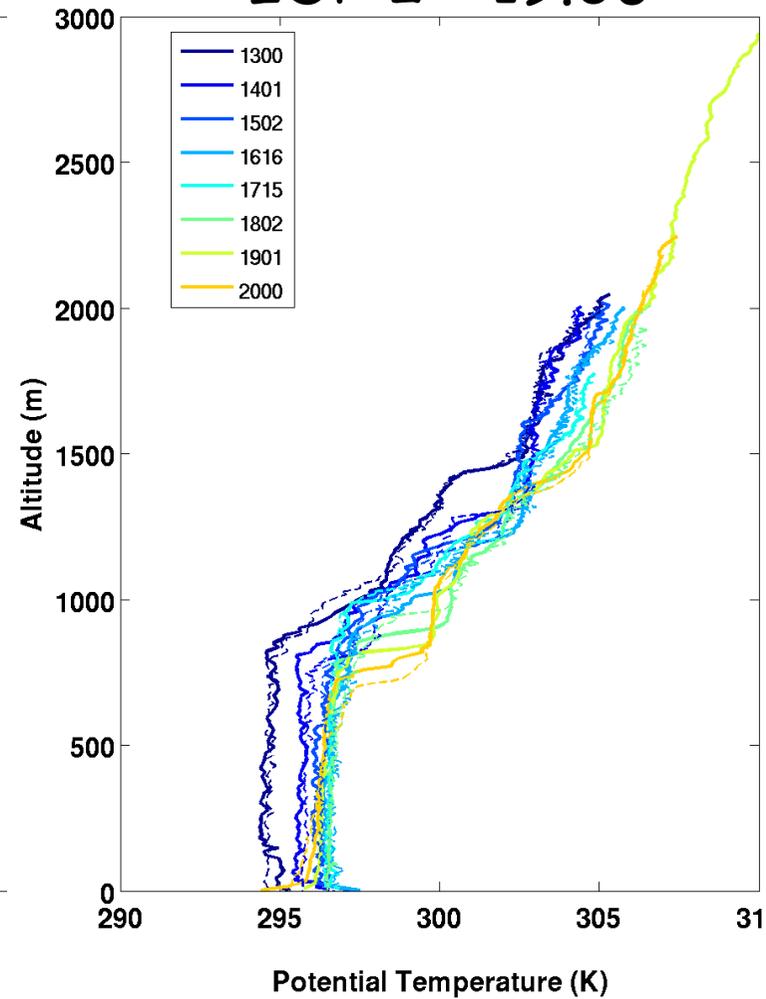


VAISALA frequent radiosondes

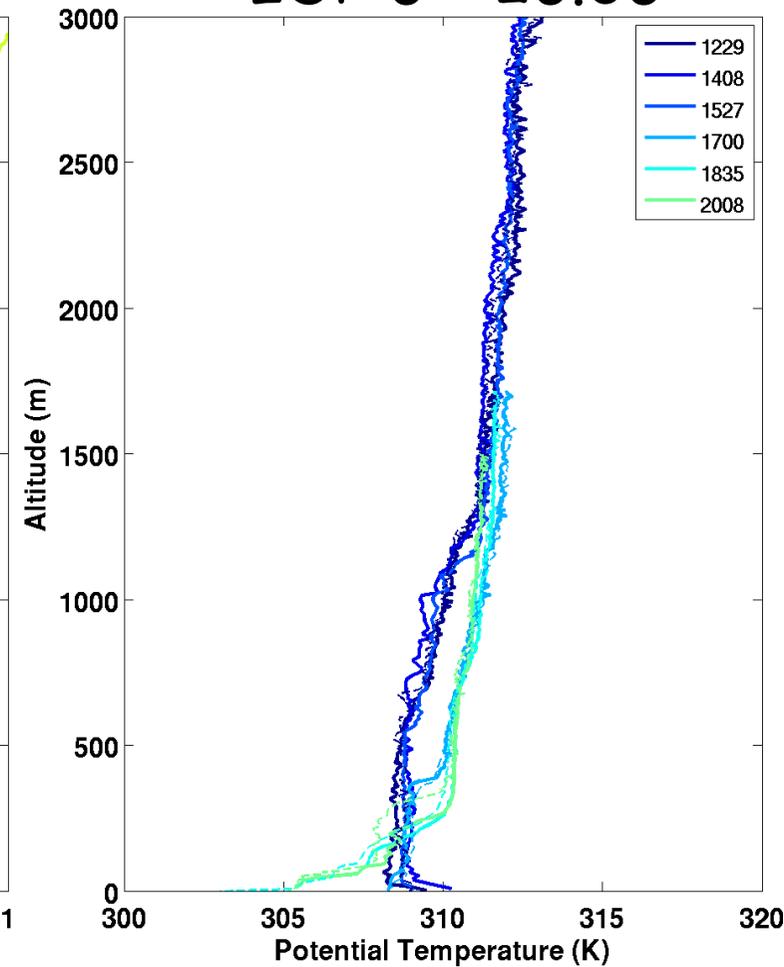
IOP 9 - 01.07

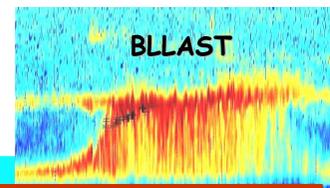


IOP 2 - 19.06



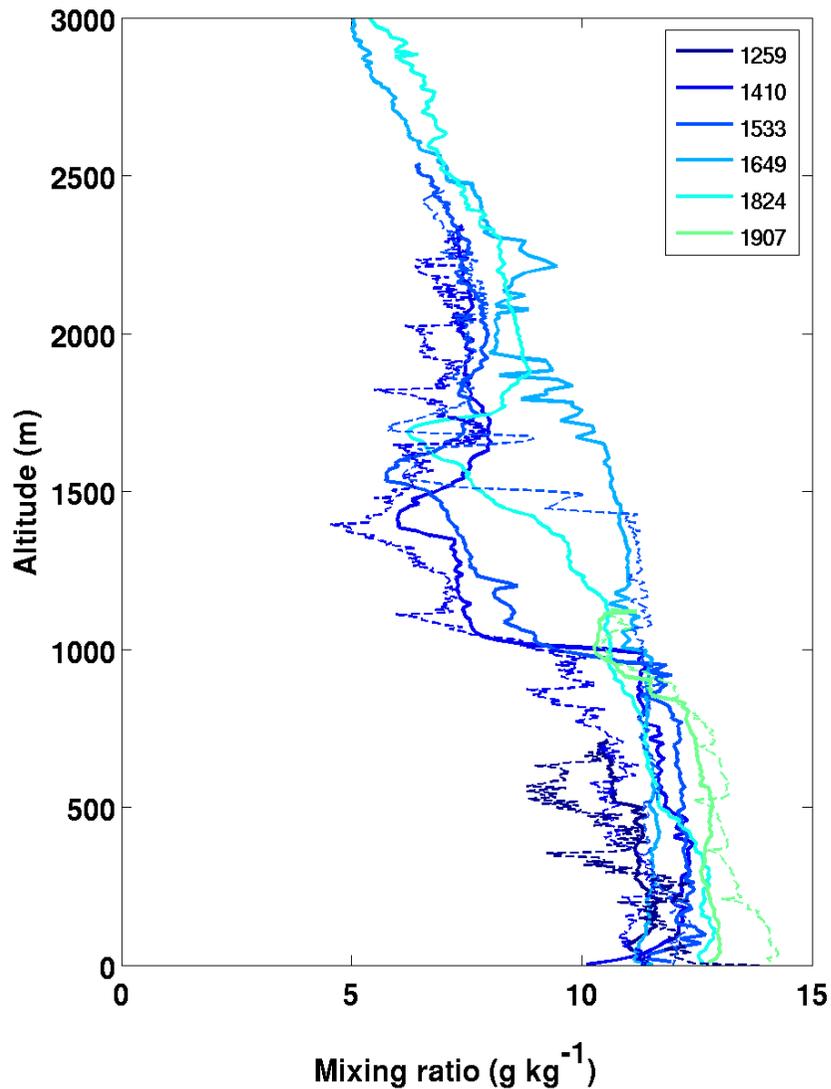
IOP 6 - 26.06



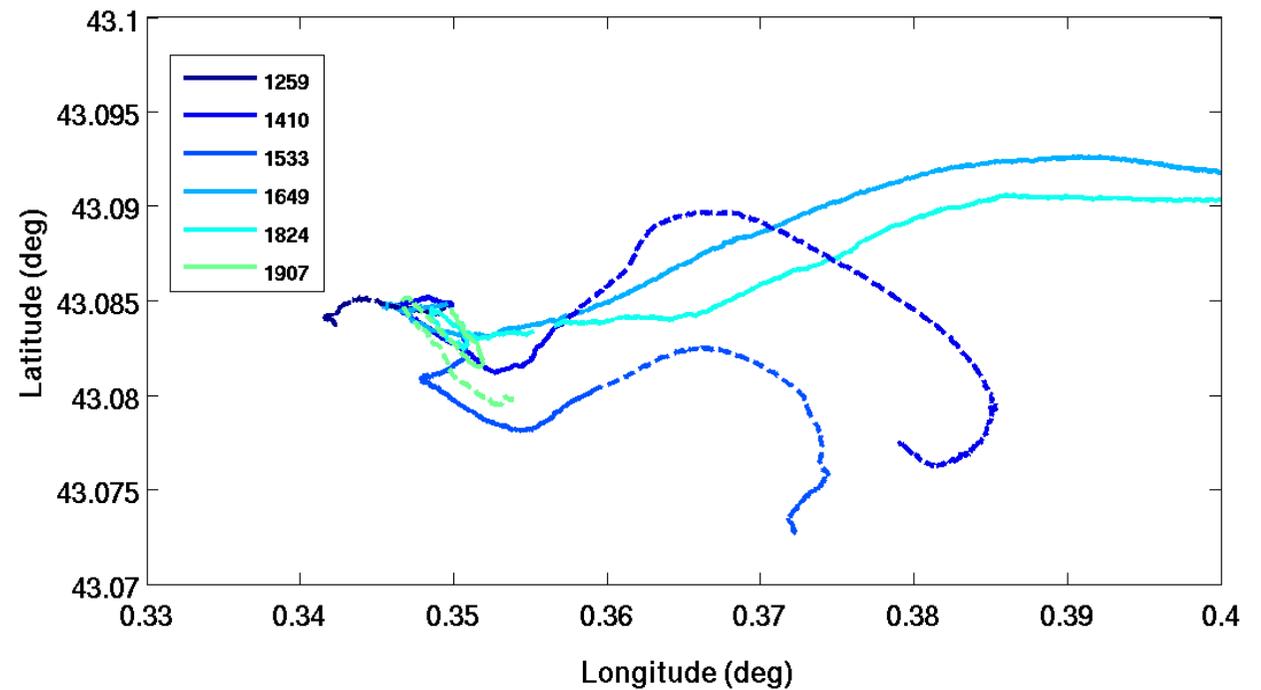


VAISALA frequent radiosondes

Water vapour mixing ratio



Trajectories



**Simultaneous Temperature differences in day,
8th WMO Radiosonde Comparison, Yangjiang, China**

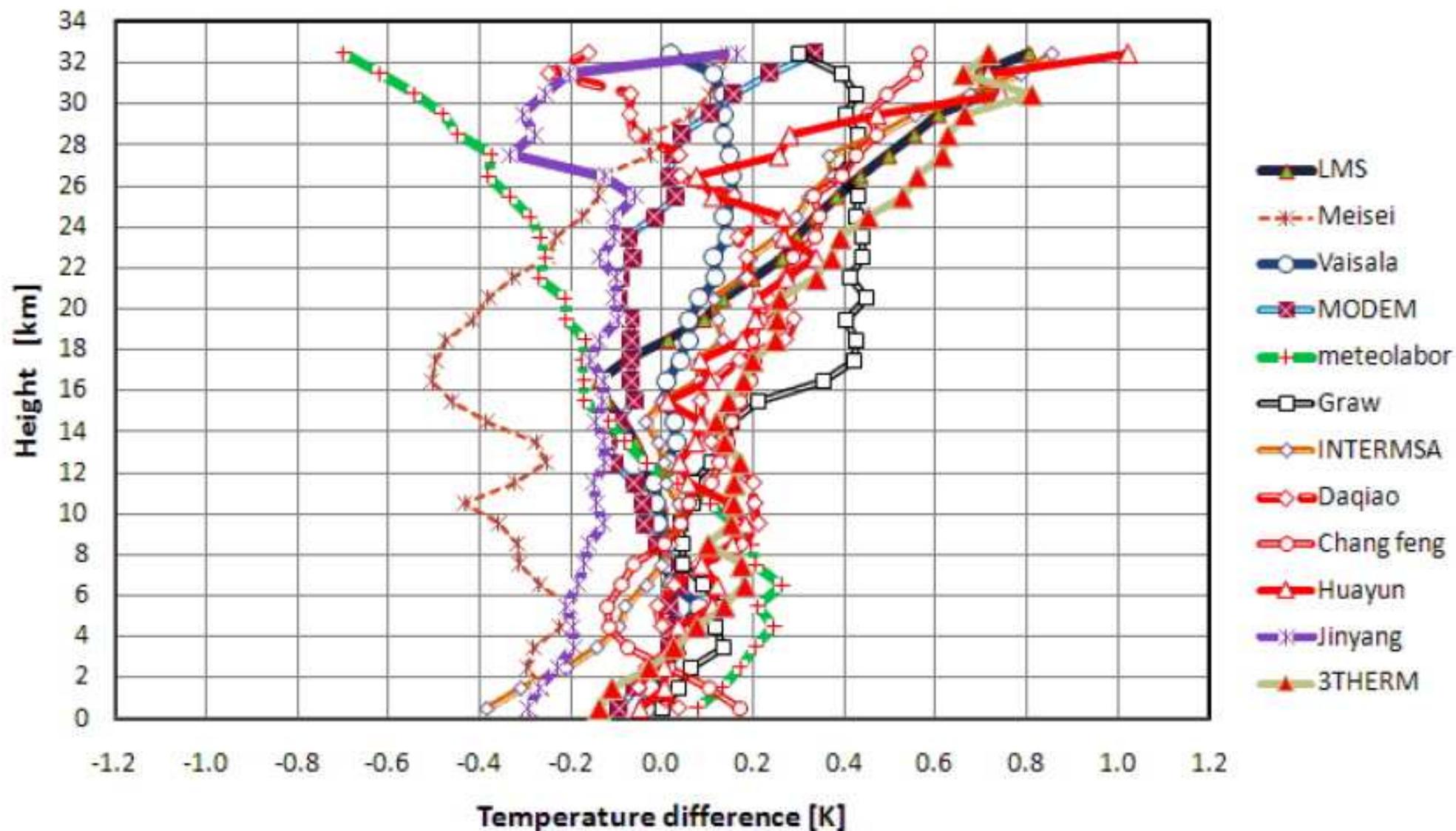
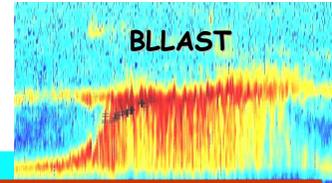


Fig. 7.1.3 Systematic bias between simultaneous temperatures (K) in the day, with reference adjusted above 16 km to take into account estimate of day-night differences in geopotential height analysis in section 7.1.6.

Accuracy of measurements



Simultaneous Temperature differences at night,
8th WMO Radiosonde Comparison, Yangjiang, China

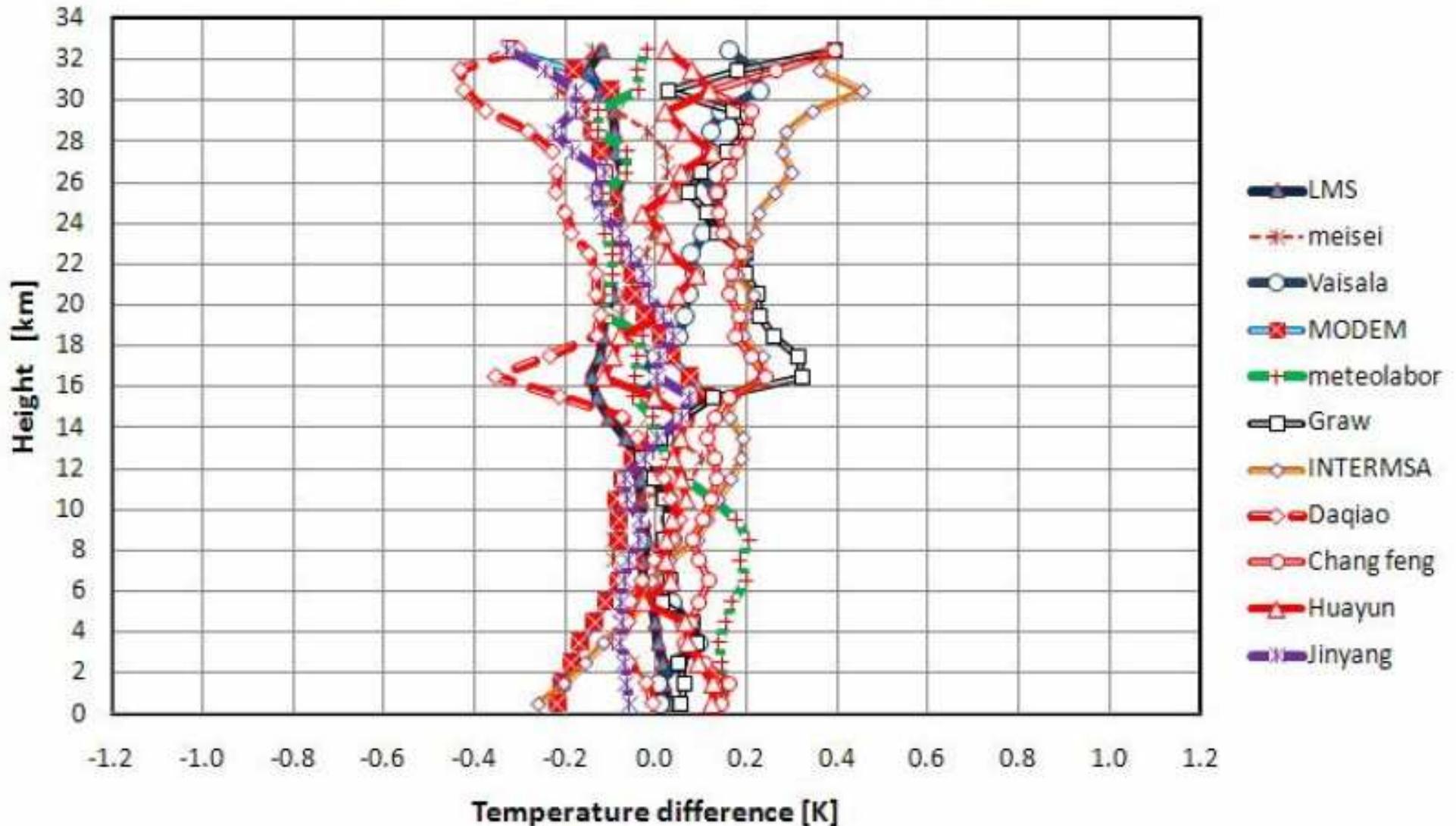
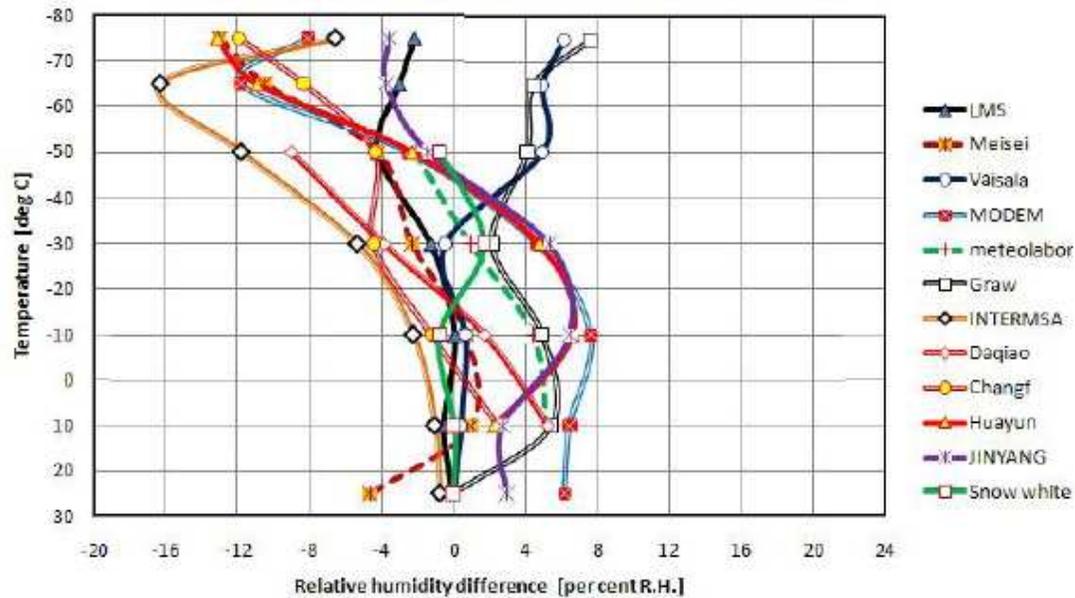


Fig. 7.1.1 Systematic bias between simultaneous temperatures (K) at night, positive bias means the radiosonde reported higher values than the reference

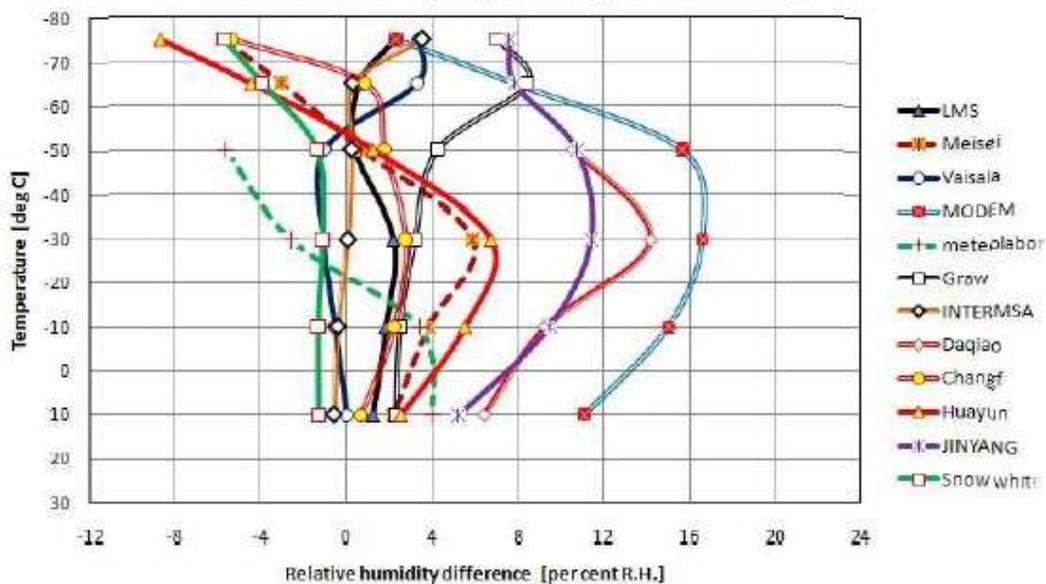
Humidity bias ?



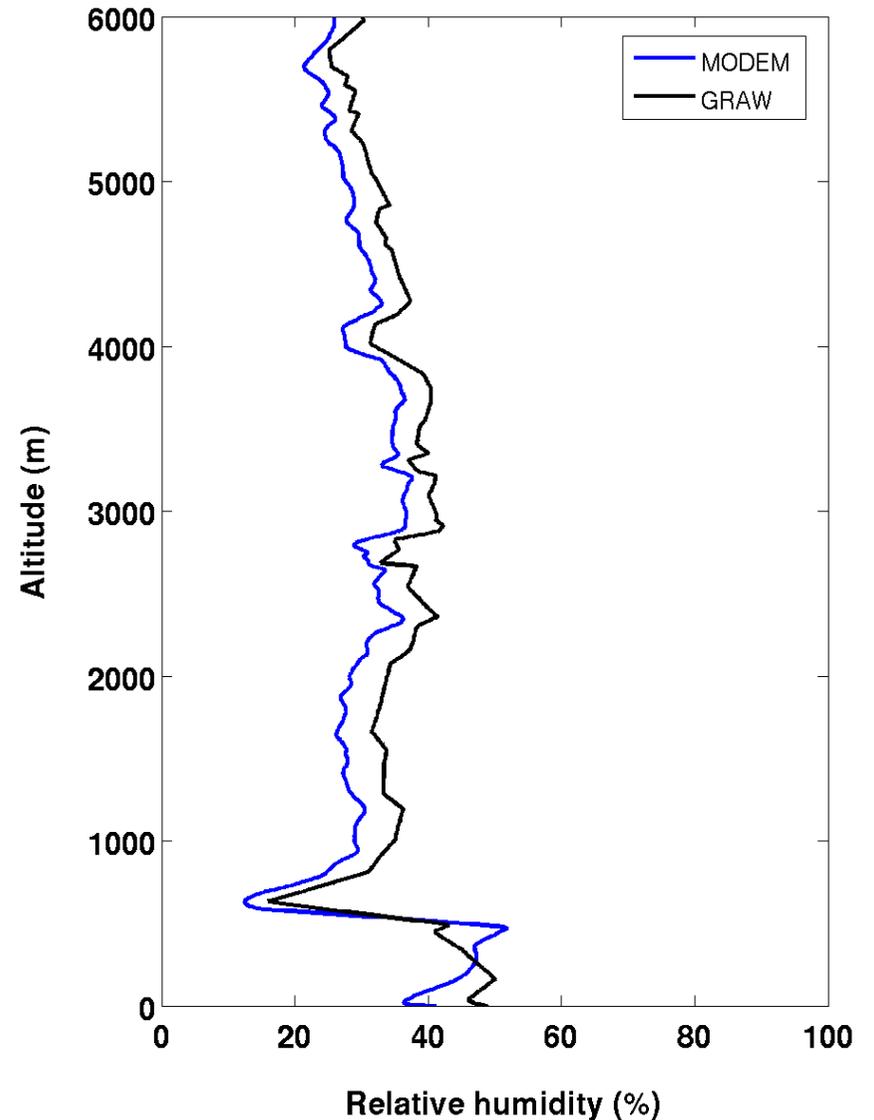
Relative humidity difference as a function of temperature for the relative humidity range 40 to 60 per cent R.H. in day



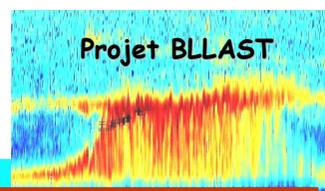
Relative humidity difference as a function of temperature for the relative humidity range 40 to 60 per cent R.H. at night



GRAW/MODEM intercomparison
25.06.2011 1100 UTC



Conclusions



- A lot of useful soundings !
- Now all available on the database
- Need for investigation and estimation of the biases in humidity measurements
- Interesting structures and sketches according to the IOPs