CIMO
8th International Radiosonde Intercomparison at Yangjiang, China
July 2010

GRUAN Contribution

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阳江凤凰酒店
YANG JIANG PHOENIX HOTEL
阳 江 凤 凰 酒 店 欢 迎 您
热烈欢迎
世界气象组织第八届国际探空仪
系统比对专家小组莅临!
Warmly welcome the experts of the 8th WMO
Radiosonde System Intercomparison
您好!
How do you do
Bonjour,Bienvenue à
Hallo,willkommen bei
Hei,Tervetuloa
Привет
こんにちは
안녕하세요

Yangjiang site

Location


Tengxian
藤县
Cangwu
苍梧县
G321
Yunan
郁南县
Yun'an
云安县
Zhaoqing
肇庆市
Sihui
四会市
G321
Guangzhou
广州市
G324
Zengcheng
增城市
Dongguan
东莞市
Foshan
佛山市
Yunfu
云浮市
Rongxian
容县
Cenxi
岑溪市
G324
Xinxing
新兴县
Heshan
鹤山市
Zhongshan
中山市
Jiangmen
江门市
Kaiping
开平市
G105
Zhuhai
珠海市
Xinyi
信宜市
Yangchun
阳春市
Enping
恩平市
Taishan
台山市
澳門
Macau
G207
Huangmaohai
黄茅海
Gaozhou
高州市
Huazhou
化州市
Maoming
茂名市
Yangxi
阳西县
G325
Mianqianhai
面前海
Wuchuan

Operational sondes launch at Yangjiang

SSI launch

Operational Radiosondes

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

Company	Radiosonde	Temp. sensor	Humidity sensor
Intermet	iMet2	Bead thermistor	Thin film Capacitor(E+E)
MODEM	M2K2DC	Bead thermistor	Capacitive polymer
GRAW Radiosondes	DFM-09	Thermistor	Thin film Capacitor(E+E)
Meteolabor	SRS-C34	Thermocouple	Hygroclip Rotronic / Snow White hygrometer
Nanjing Da Qiao Machine Co Ltd	GTS1-2 digital	Cylindrical thermistor	HS02 China Humicap
JIN YANG	RSG-20A	NTC Thermistor	Thin film Capacitor(E+E)
MEISEI Co. LTD	RS-06G	Thermistor	Capacitance polymer
Vaisala Oyj	RS92-SGP	Capacitive wire	Thin film capacitor, heated twin sensor
Beijing Chang Feng	CF-06-A	Bead resistance	Thin film Capacitor (E+E)
China HUAYUN	GTS(U)1-1	Bead thermistor	Thin film Capacitor(E+E)
Lockheed Martin Sippican INC	GPS LMS6	Chip thermistor	Thin film Capacitor(E+E)

Scientific Soundings Instruments

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SSI Sensor	Company	Radiosonde	Temperature Sensor	Humidity sensor	Comments
CFH	EnSci Corp.	Intermet Imet1	-	Frost-point hygrometer	PTU from RS92
RD100	Vaisala Oyj	Vaisala RS92	-	Thin film Drycap	Not in comparisons
MTR	MEISEI Co. LTD	Meisei RS-06G	Tungsten wire	-	
Multithermistor	L. M. Sippican INC	LMS-6	Multi chip thermistors	Thin film (E+E)	
	Graw GmbH	DFM-09	Thermistor	Thin film (E+E)	Opportunity sonde

GRUAN Lead Centre

Campaign period

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

Campaign period July 12-Aug 3

72 Launches in total:

60 launches of operational radiosondes 4 x daily in 2 groups

Each manufacturer approx 15x day, 15x night

12 launches of SSI payloads 6x night, 6x day

Scientific Soundings Instruments

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Flight #	Date	Time (LST)	Para-chute	Un-winder	Graw	Comments
02 (1)	7/14/10	12:58:00	y	n	n	
10 (2)	7/16/10	02:59:28	y	y	n	
15 (3)	7/17/10	02:56:49	n	y	n	No MTR/Meisei GPS/P data
20 (4)	7/18/10	03:06:25	y	n	n	
26 (5)	7/20/10	12:51:23	y	n	n	
32 (6)	7/21/10	14:45:02	y	y	y	MTR broke at launch; no Multithermistor data
43 (7)	7/25/10	03:01:24	y	n	y	RR01&MTR tied to bamboo rig
48 (8)	7/26/10	02:49:51	y	n	y	RR01 tied to bamboo rig,
53 (9)	7/27/10	02:55:47	y	y	n	RR01 tied to bamboo rig; No MTR (shortage of sondes); CFH suspended on side
56 (10)	7/28/10	15:05:31	y	y	y	RR01&MTR tied to bamboo rig
61 (11)	7/29/10	14:48:34	y	y	y	RR01&MTR tied to bamboo rig
66 (12)	7/30/10	14:53:00	y	y	y	RR01&MTR tied to bamboo rig

Remote sensing

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Equipment	Provided by
GPS/MET water vapour network	CMA
S band Doppler Weather Radar	CMA
All-sky imager	?
Millimetre-wave Cloud-detection Radar	?
Mobile Boundary Layer Wind Profiler Radar	?
CL51 Ceilometer	Vaisala
Microwave Radiometer	?

Report

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Wetter und Klima aus einer Hand

Report about this campaign is currently in preparation

1st writing workshop in Geneva 15-18 February 2011

Details on the comparison are confidential until manufacturers comments are included

Manufacturers meeting at Payerne 29-31 March 2011

Final release of report May/June 2011

Balloon performance

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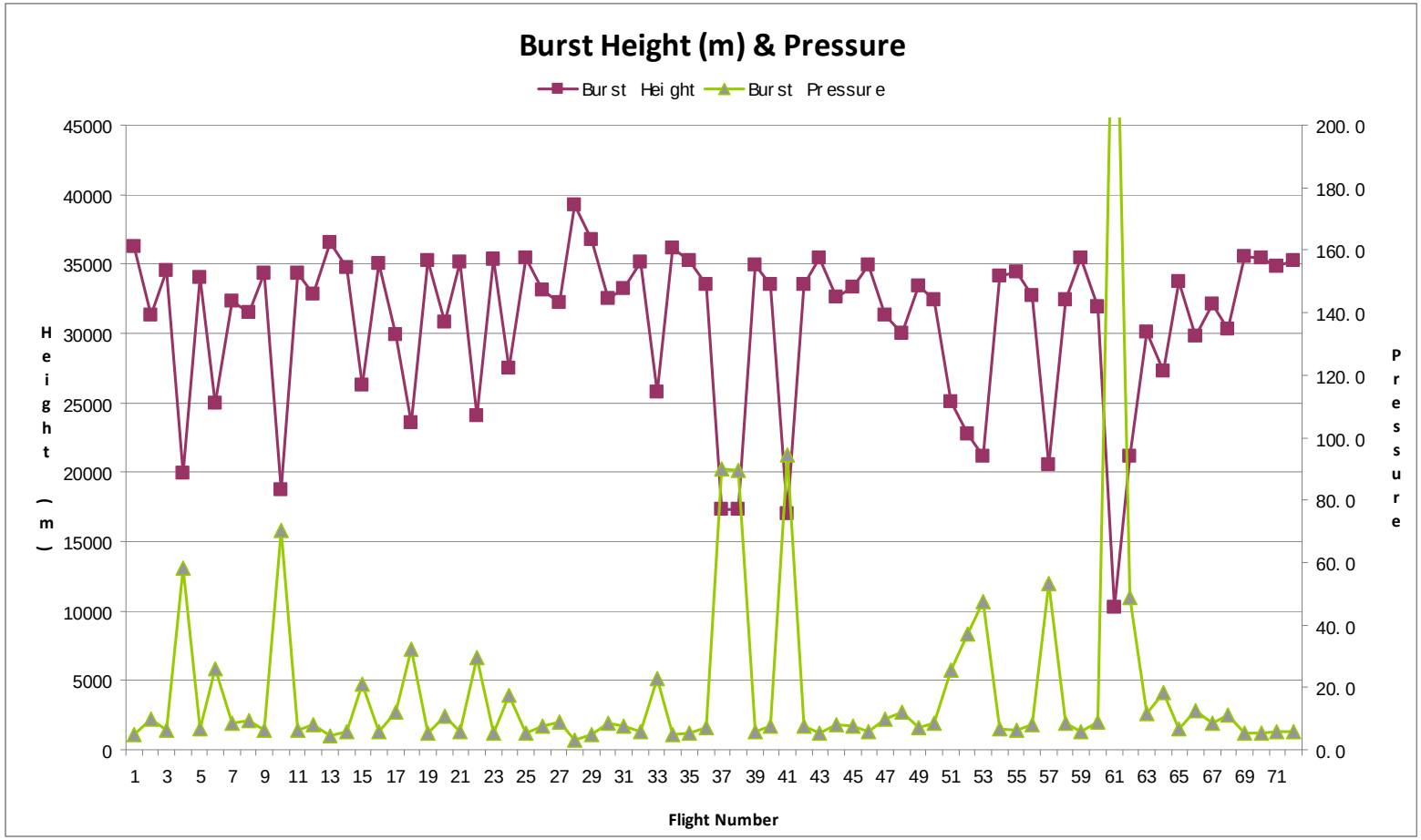
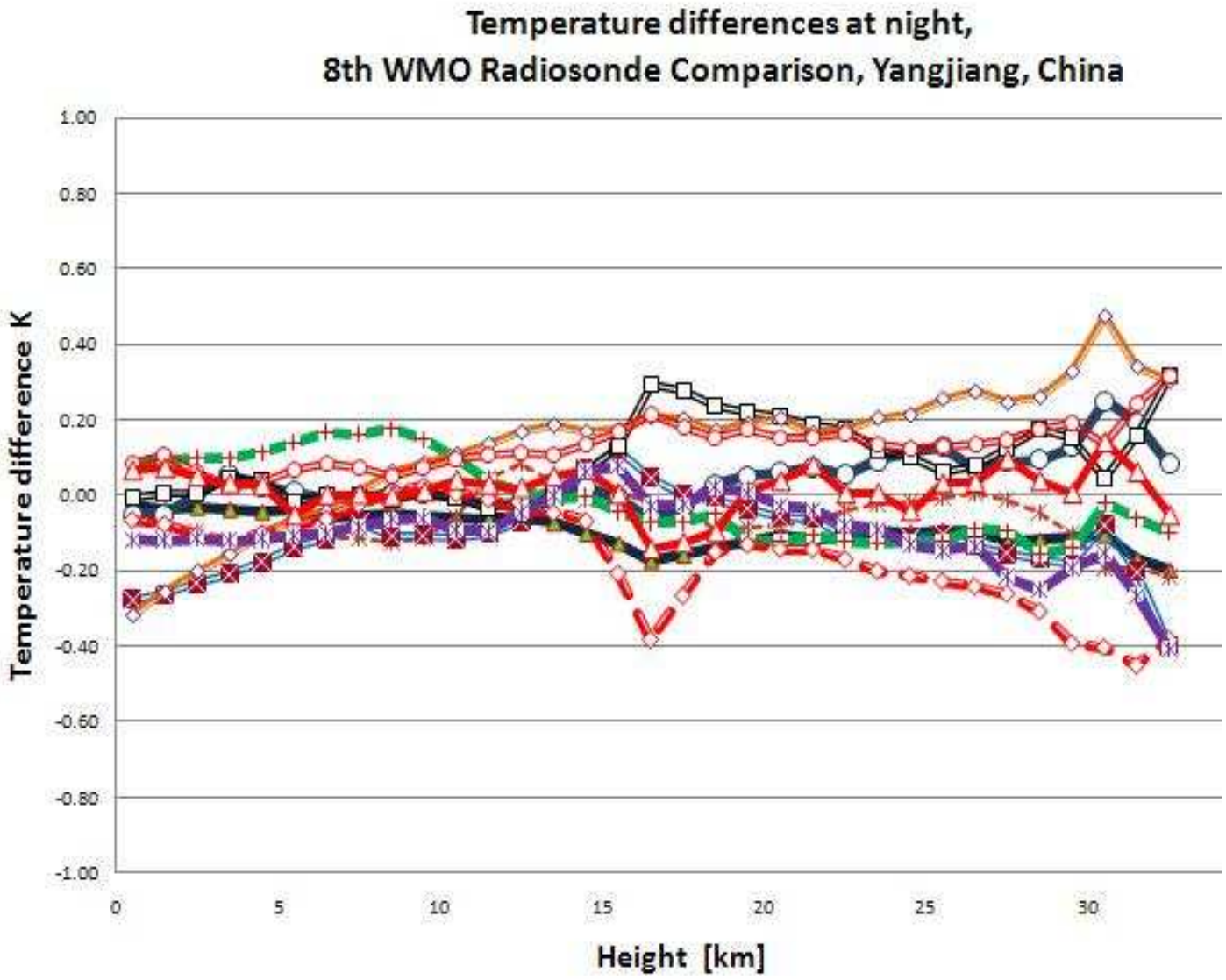
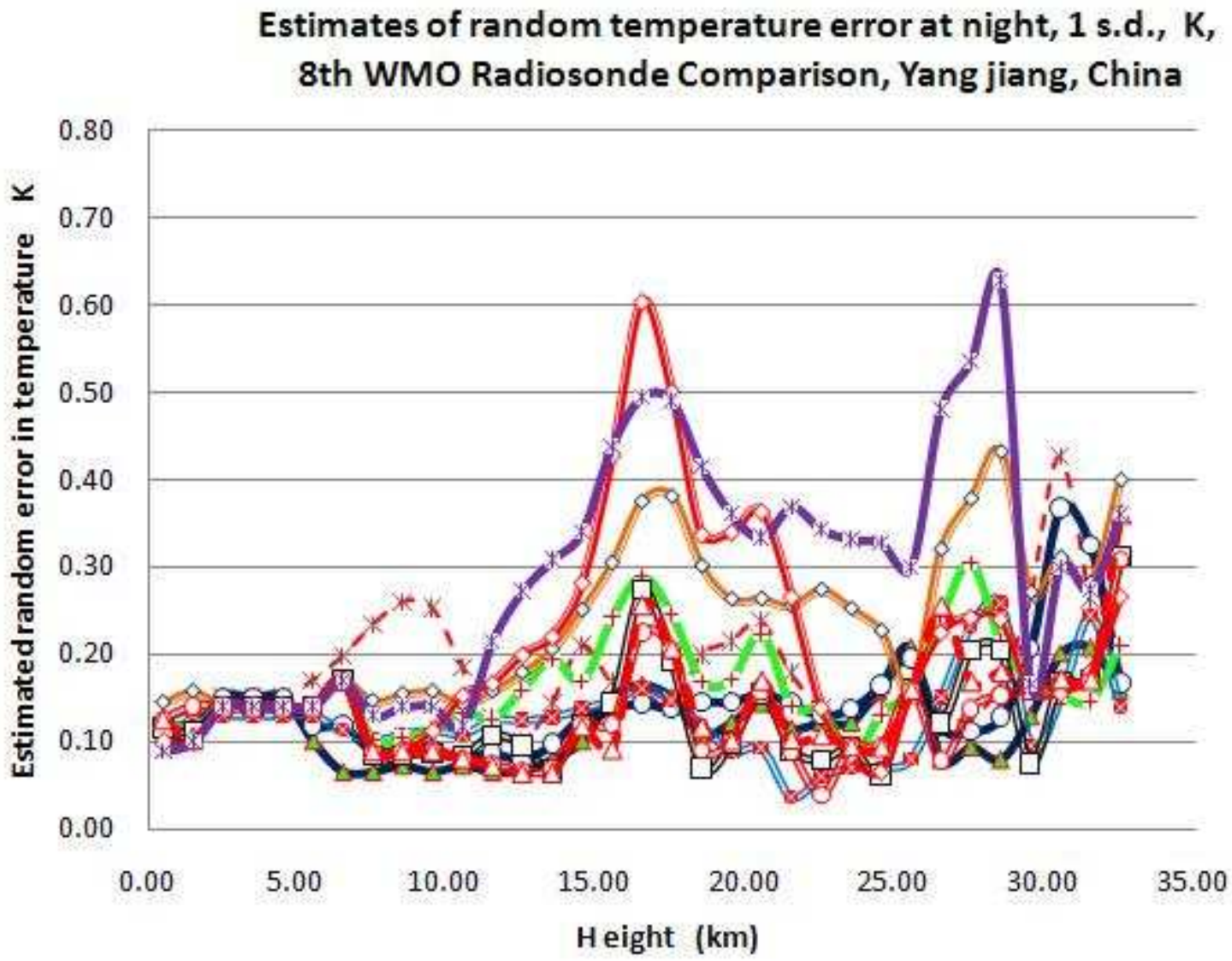


Temperature night



Temperature night



Temperature day

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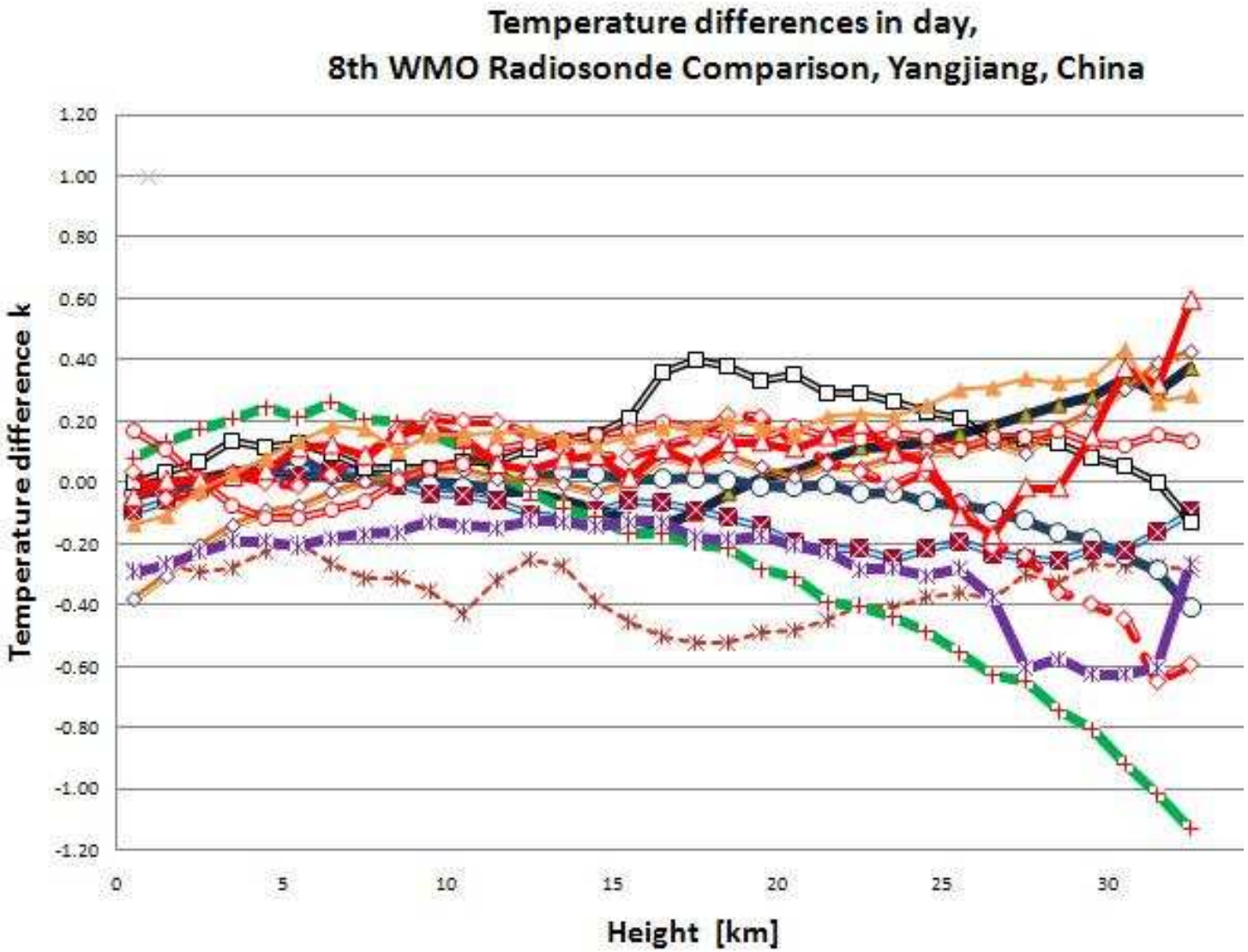
Wetter und Klima aus einer Hand



Temperature day

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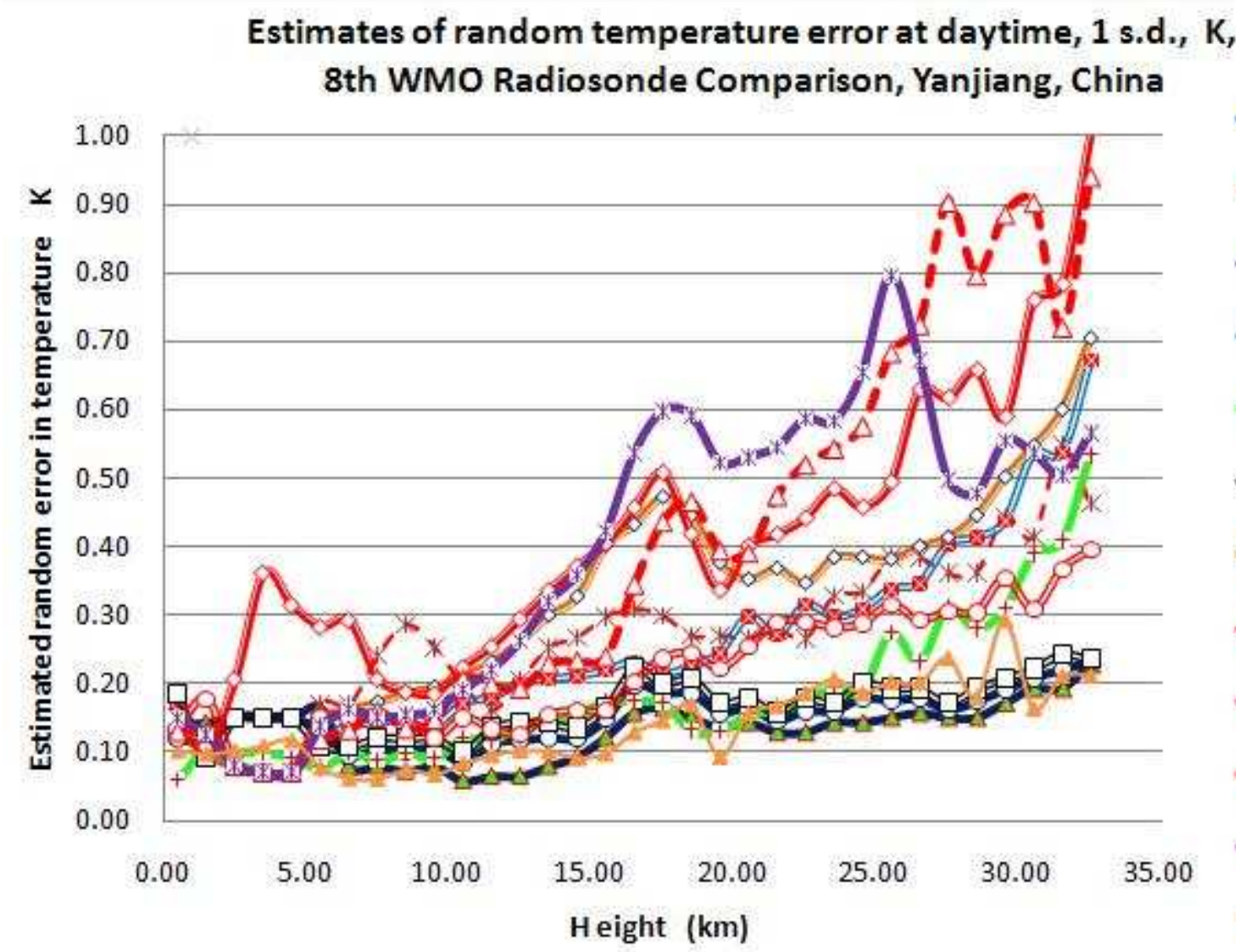
Wetter und Klima aus einer Hand



Temperature comparison
Multithermistor vs Vaisala

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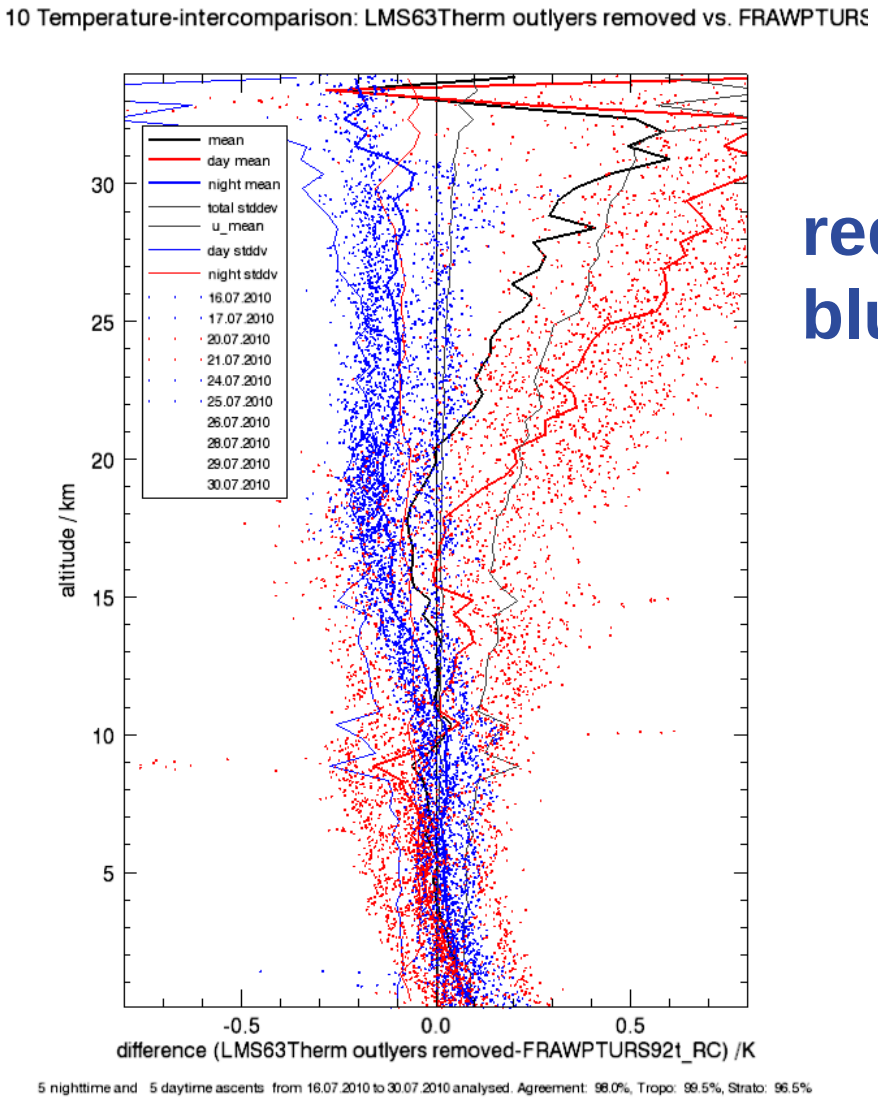
Wetter und Klima aus einer Hand



red: daytime
blue: nighttime

Temperature comparison
Meisei MTR vs Vaisala

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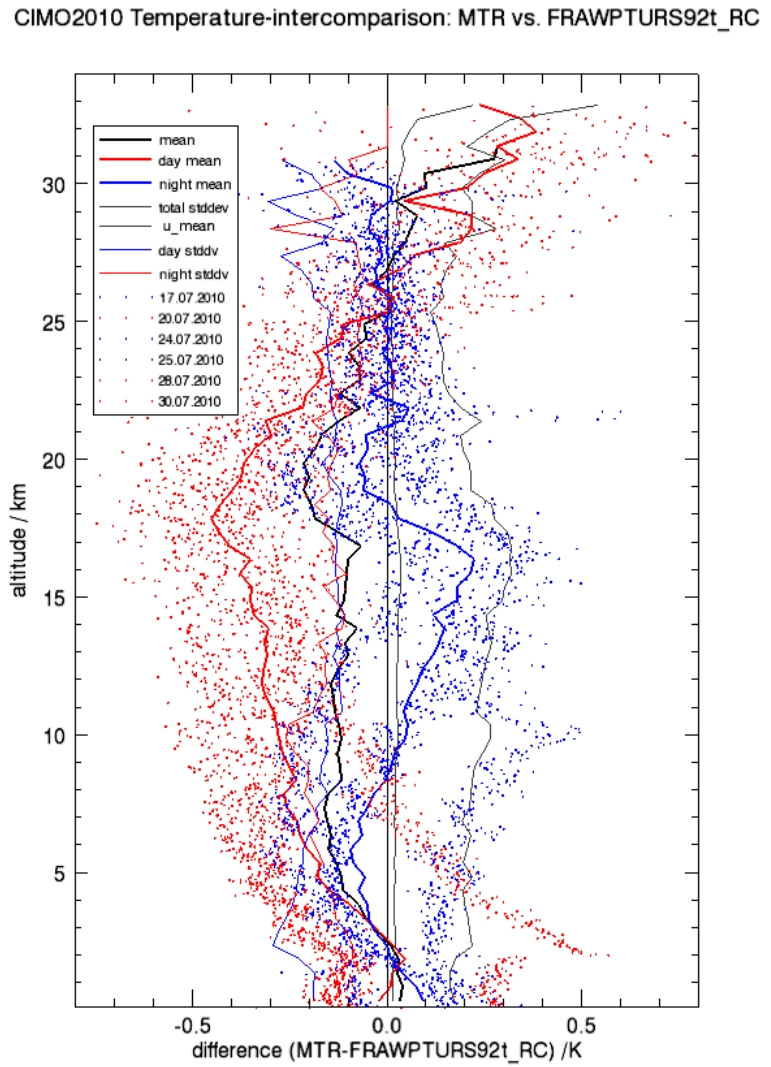


3 nighttime and 4 daytime ascents from 17.07.2010 to 30.07.2010 analysed. Agreement: 75.0%, Tropo: 56.4%, Strato: 94.6%

Water vapor

RD100 first tropical test

Understanding that this is a test of an instrument in development and that failure may happen

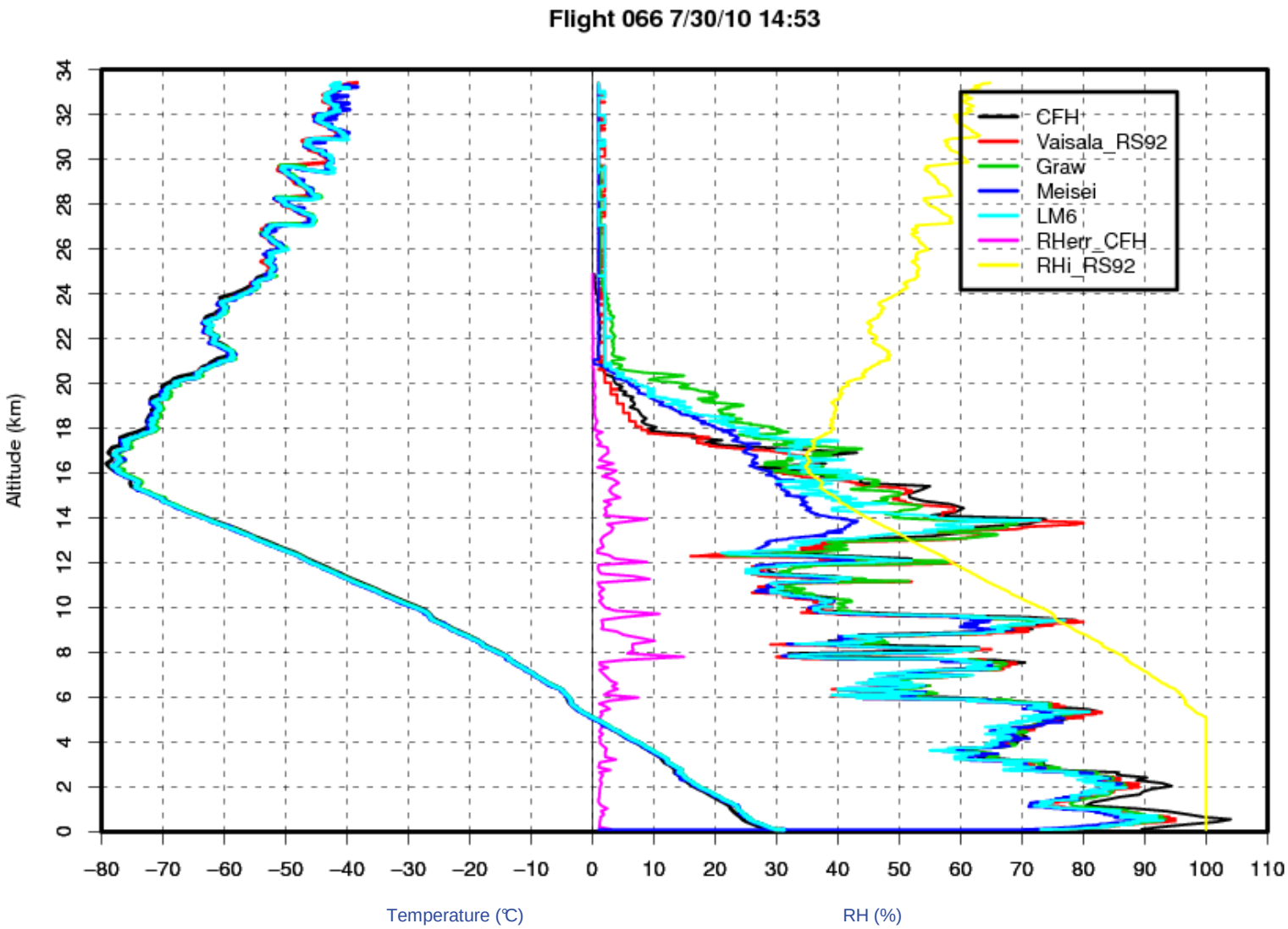
Fear of contamination in liquid clouds

Use of rainshield, which was supposed to open in mid troposphere

Rainshield mechanism failed
- ➔sensor could not equilibrate to outside conditions
- ➔no useful measurements using RD100

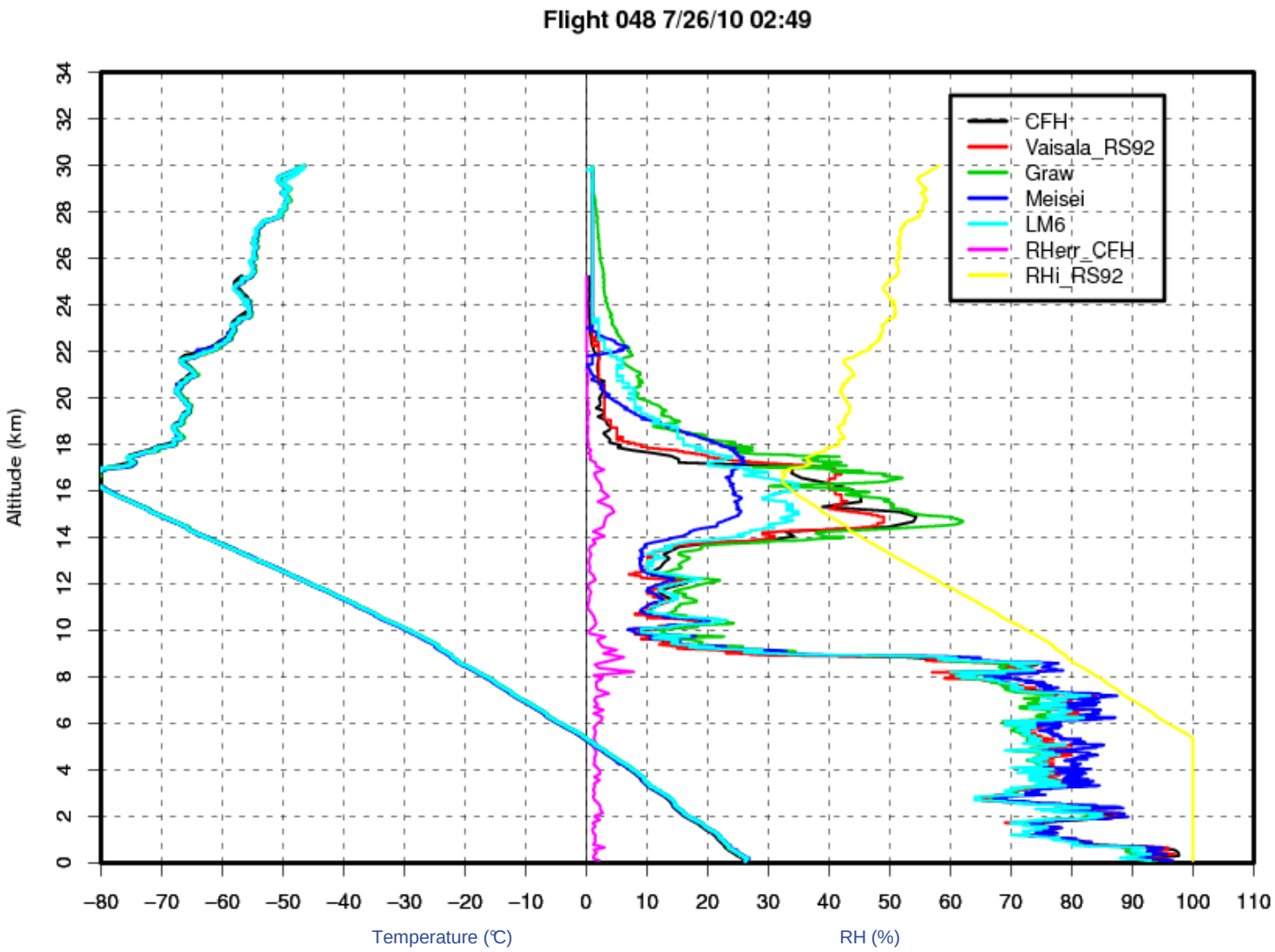
Water vapor nighttime operational sensors on SSI payload

Deutscher Wetterdienst
Wetter und Klima aus einer Hand

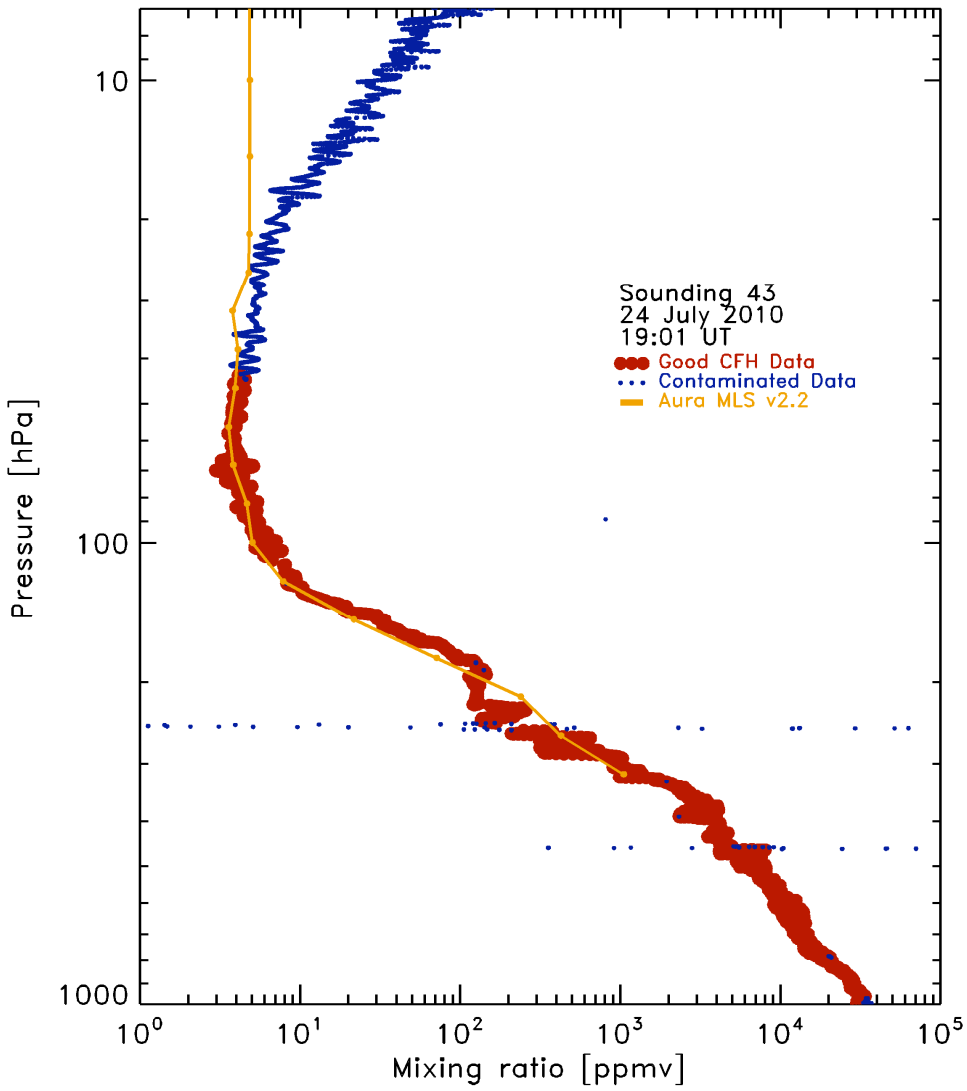


Water vapor daytime operational sensors on SSI payload

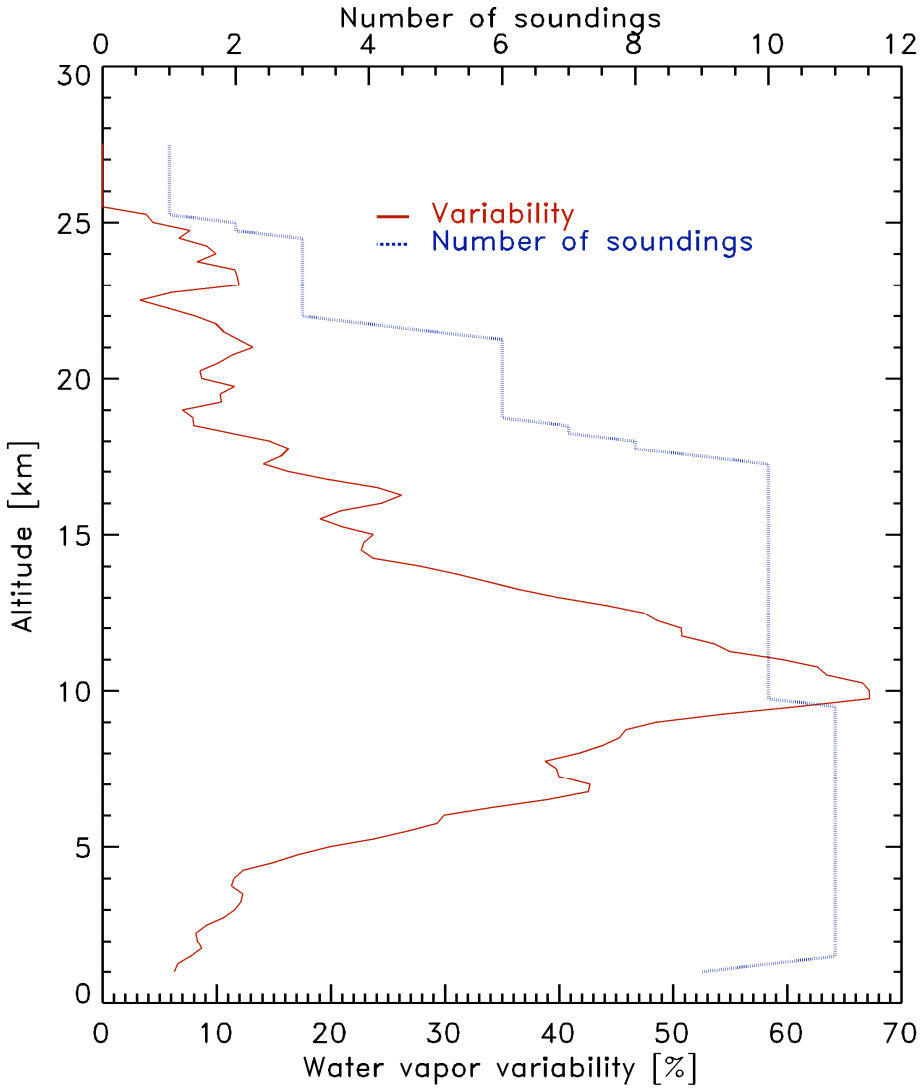
Deutscher Wetterdienst
Wetter und Klima aus einer Hand



CFH profile

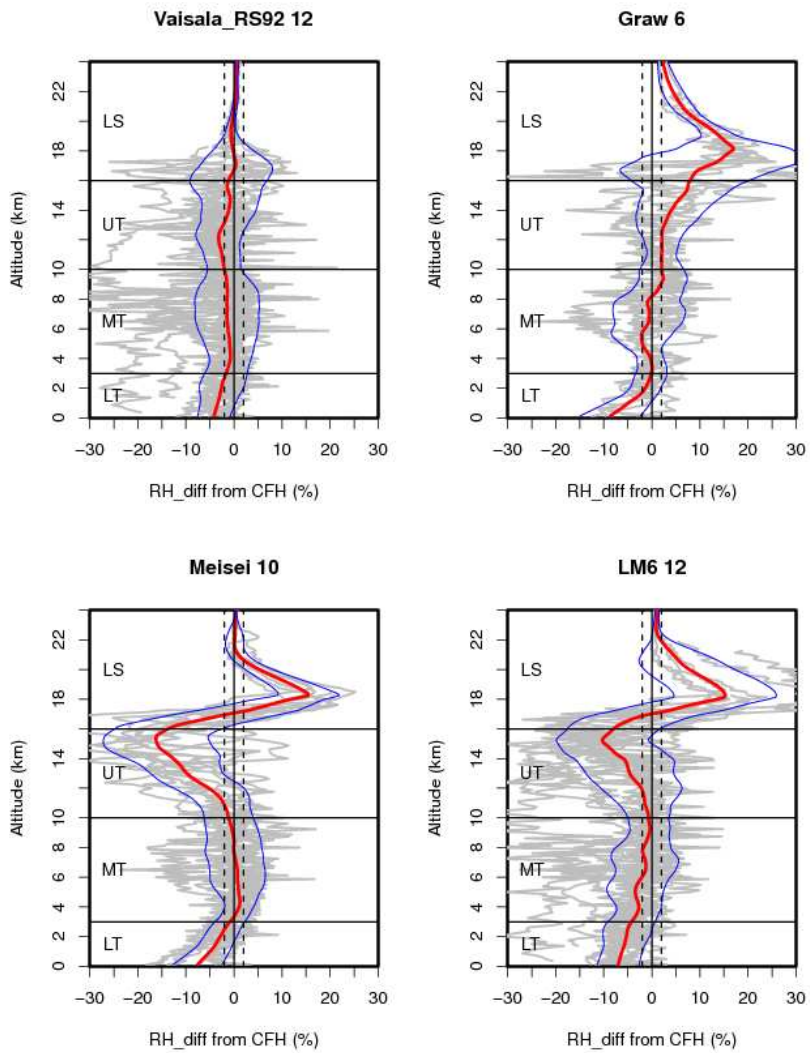

Sounding 43
24 July 2010
19:01 UT
Good CFH Data
Contaminated Data
Aura MLS v2.2
Pressure [hPa]
10
100
1000
10^0
10^1
10^2
10^3
10^4
10^5
Mixing ratio [ppmv]

CFH data availability as function of altitude all soundings

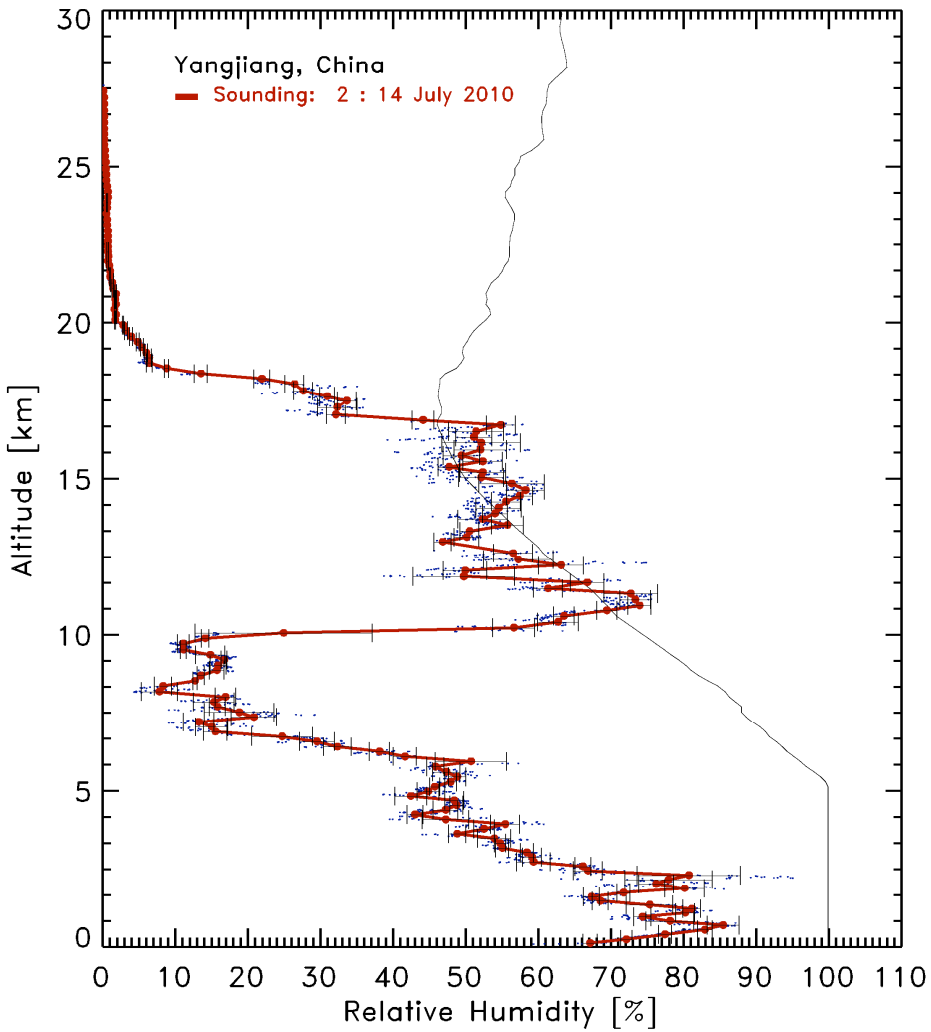


Water vapor all launch times operational sensors on SSI payload vs CFH

Deutscher Wetterdienst
Wetter und Klima aus einer Hand



CFH uncertainty estimates



Water vapor all launch times operational sensors on SSI payload vs CFH

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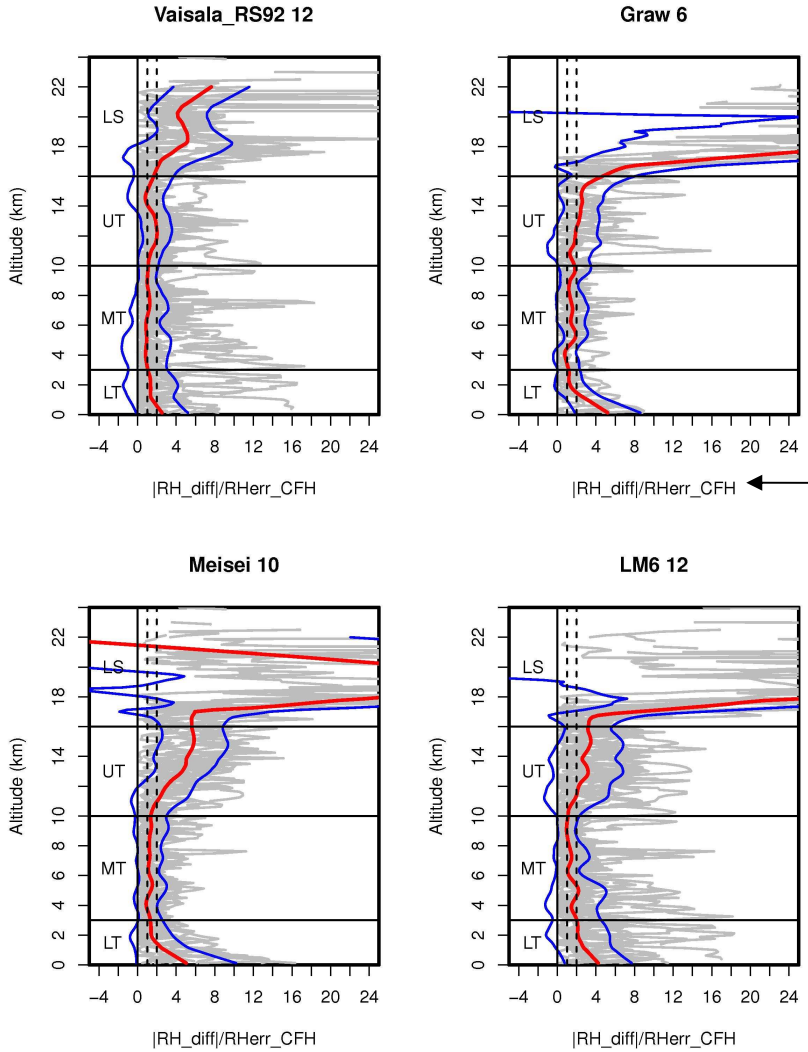
Consistency Test using CFH uncertainty estimates



$$k = \frac{|m_1 - m_2|}{\sqrt{u_1^2 + u_2^2}}$$