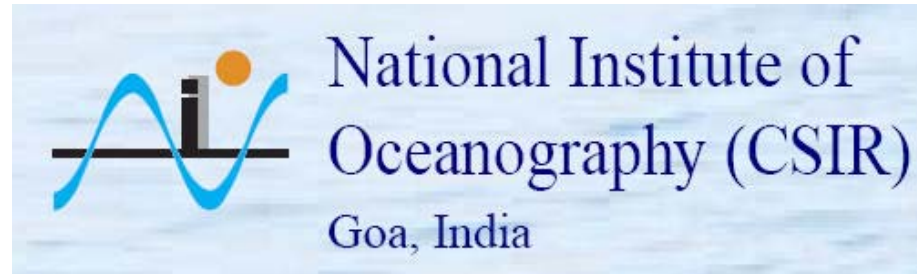


**EVOLUTION OF ATMOSPHERIC
THERMAL STRUCTURE
DURING 2003 MONSOON ONSET**

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Indian Institute of Science, Bangalore

***National Workshop on
Arabian Sea Monsoon Experiment
(ARMEX)
Data Analysis & Modelling***
19-21 April, 2006

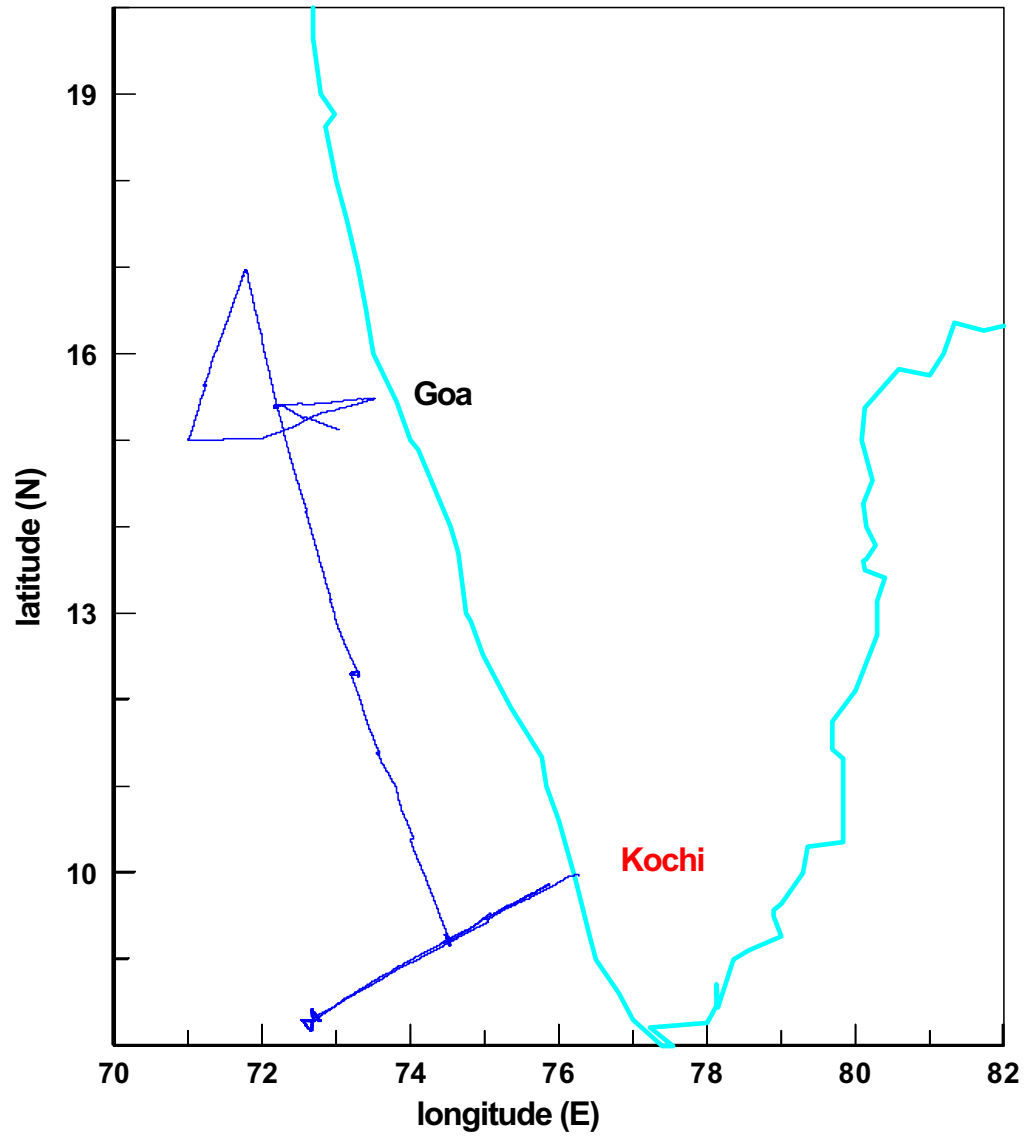


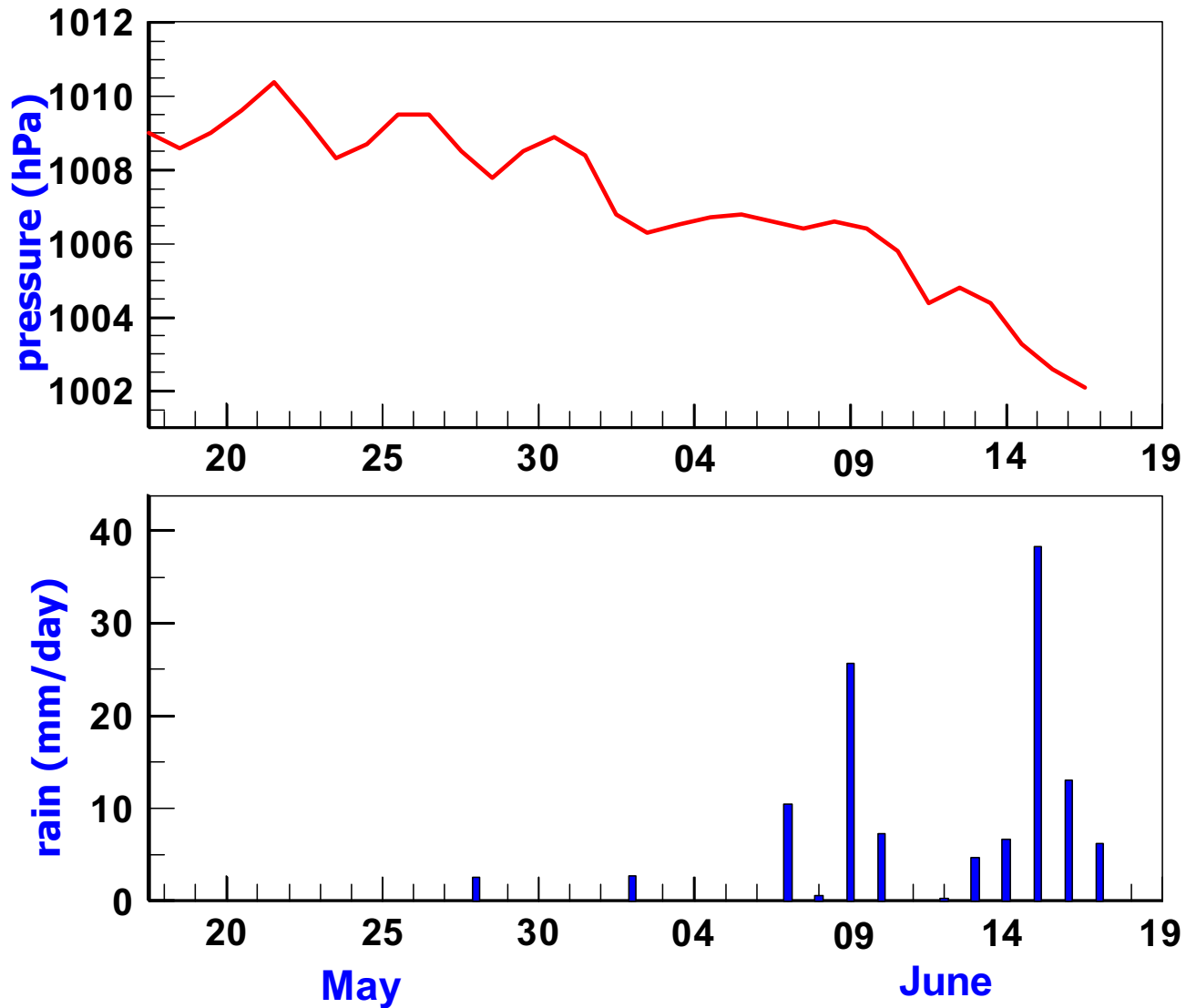
**Acknowledgements: DST, DOD (NCAOR), IMD,
Fellow Scientists & Ship Crew,**

1. Vertical thermal structure of the Atmosphere

2. Inter-comparison of Vaisala & NCEP data

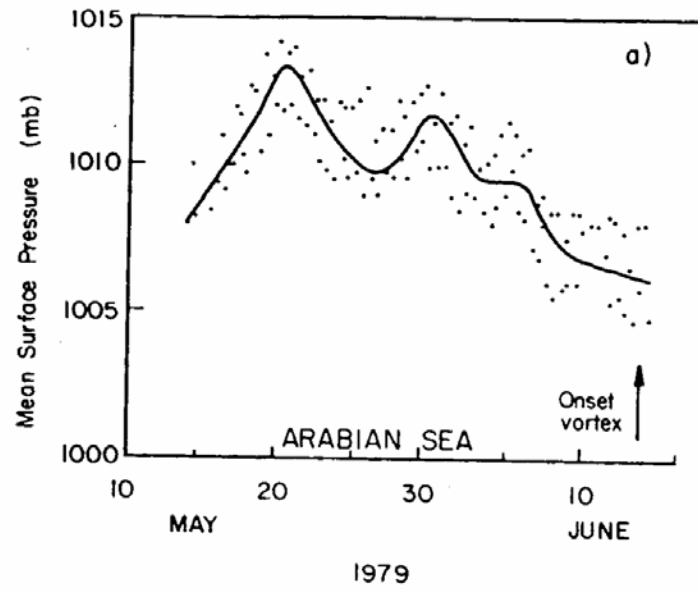
**3. Average characteristics of T, RH & q profiles
over the Indian Ocean**



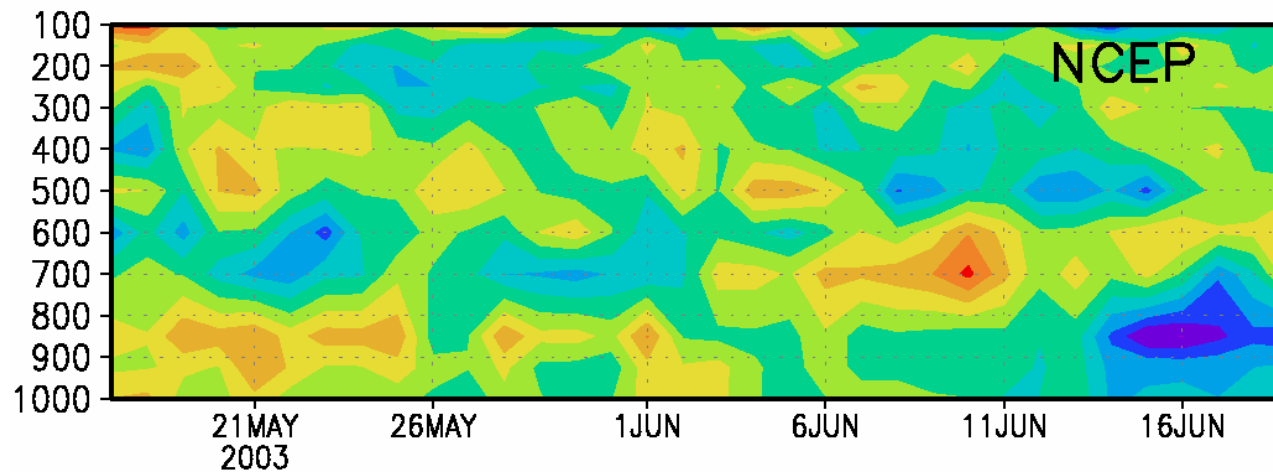
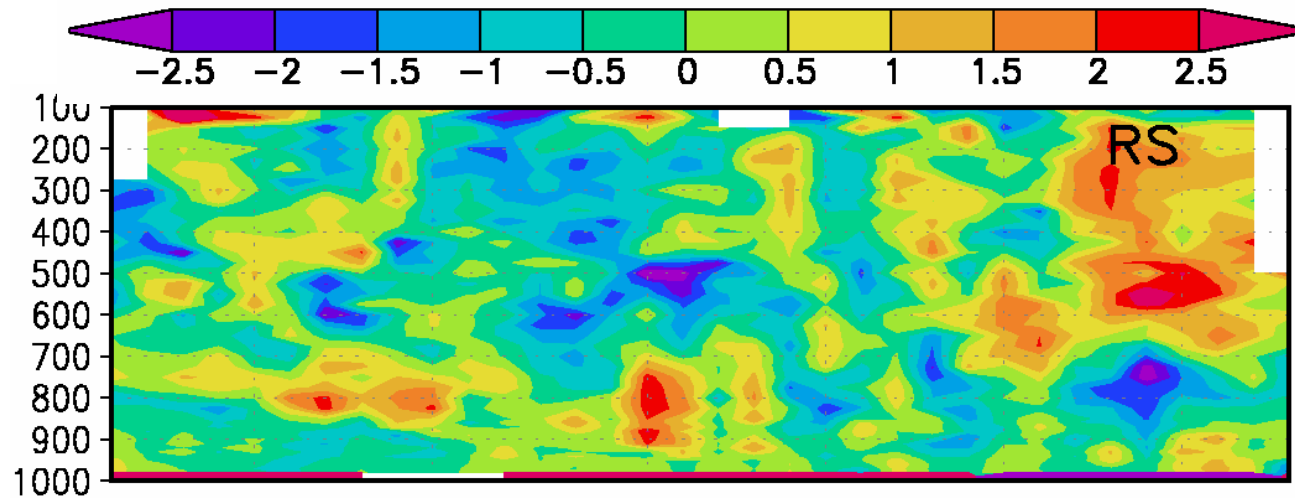


Daily average pressure and rainfall during May-June (SK193)

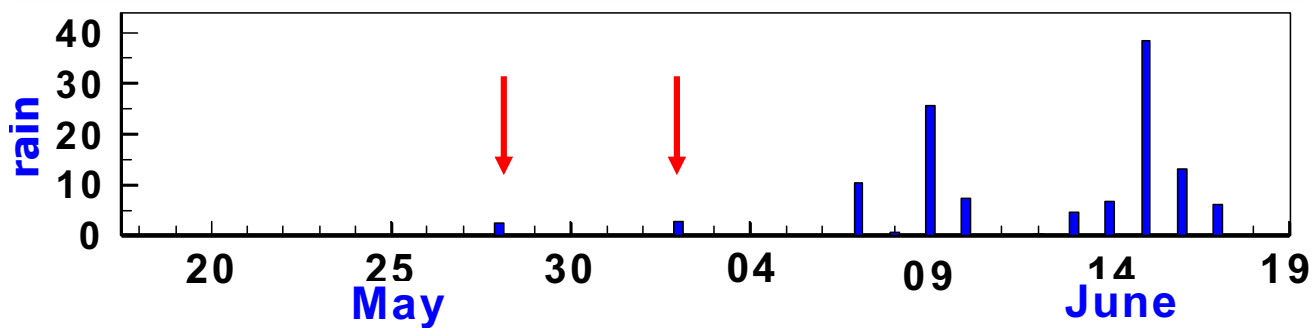
Lat.(°N) -1.6 4.2 4.2 4.2 5.4 7.0 7.0
Long.(°E) 53.0 55.0 55.0 59.4 66.7 66.7 66.7



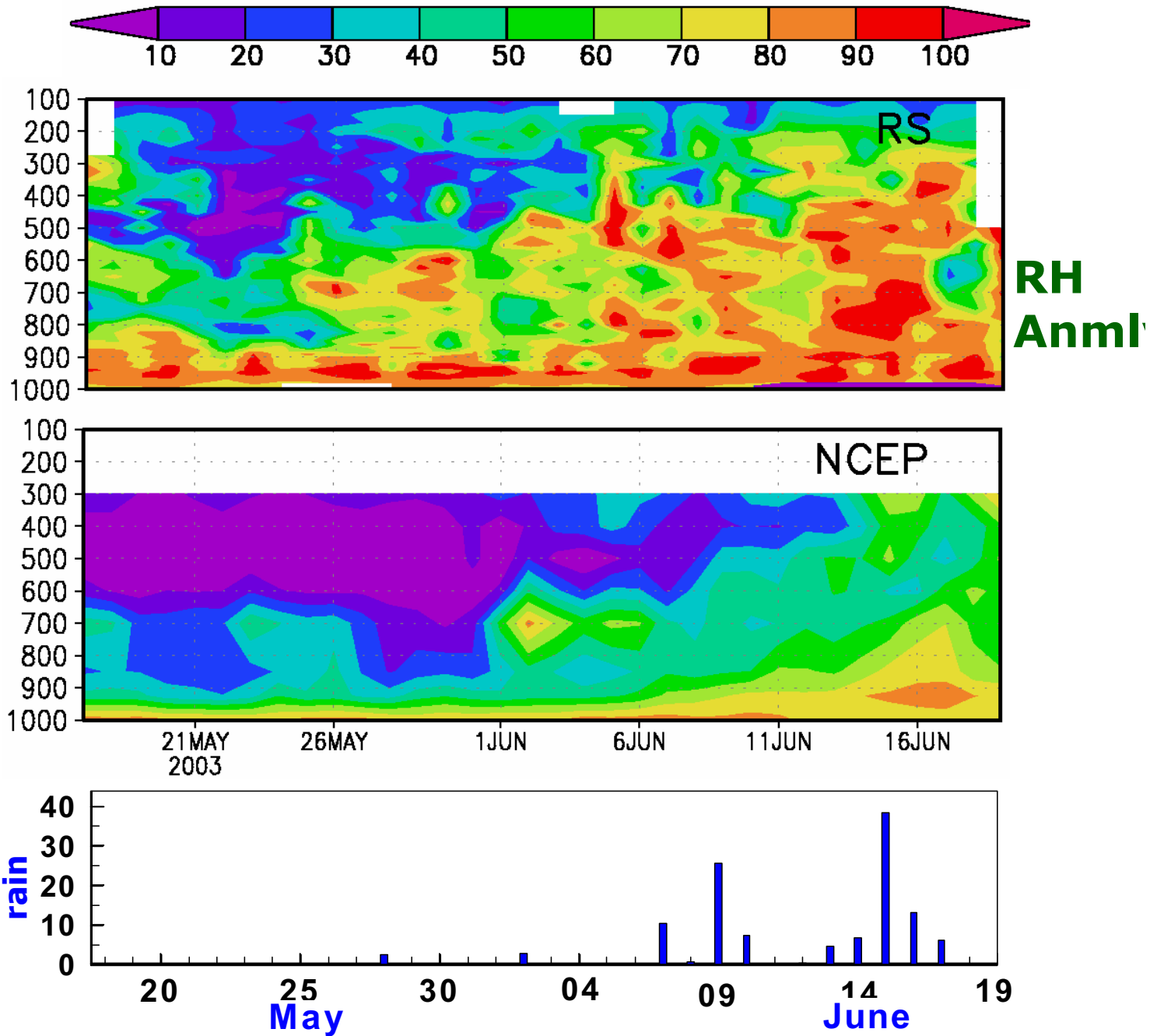
Holt & Raman, MONEX-79, BLM, 1987)



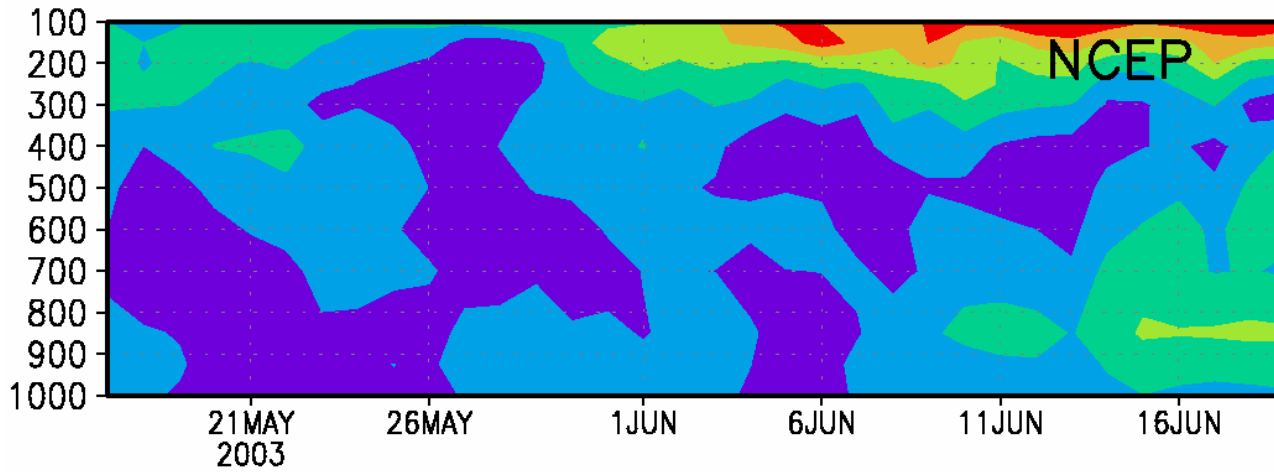
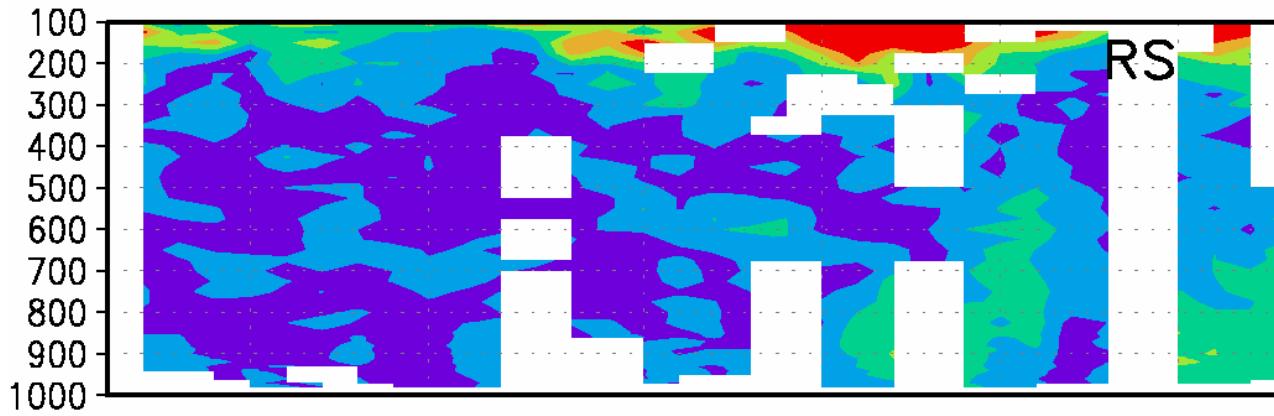
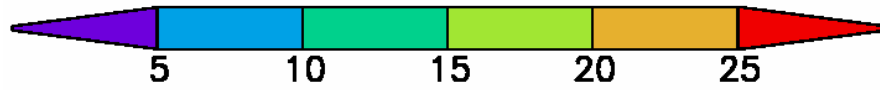
**Temp.
Anmly**



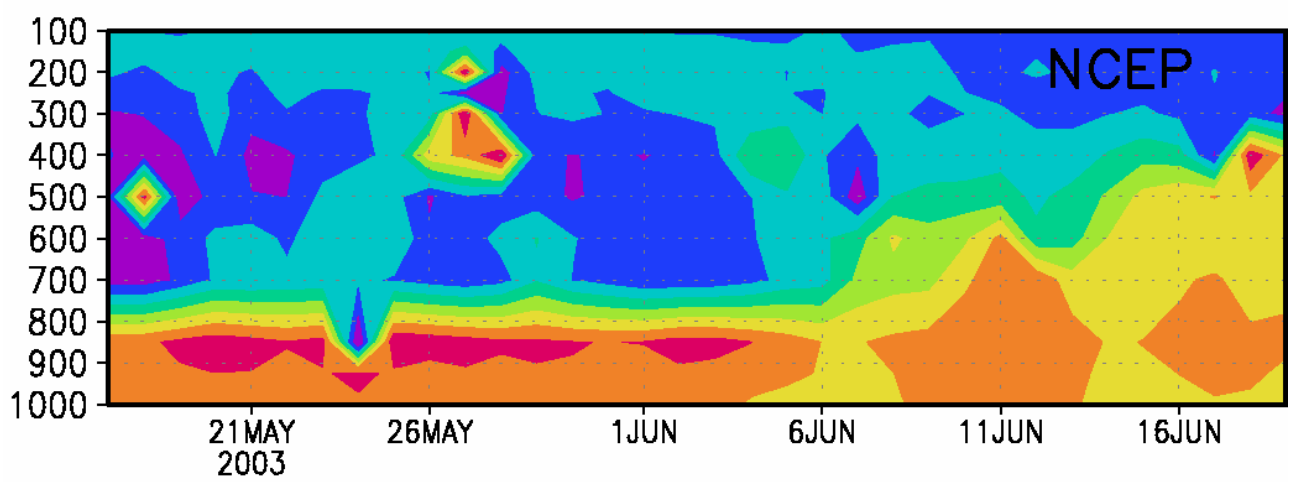
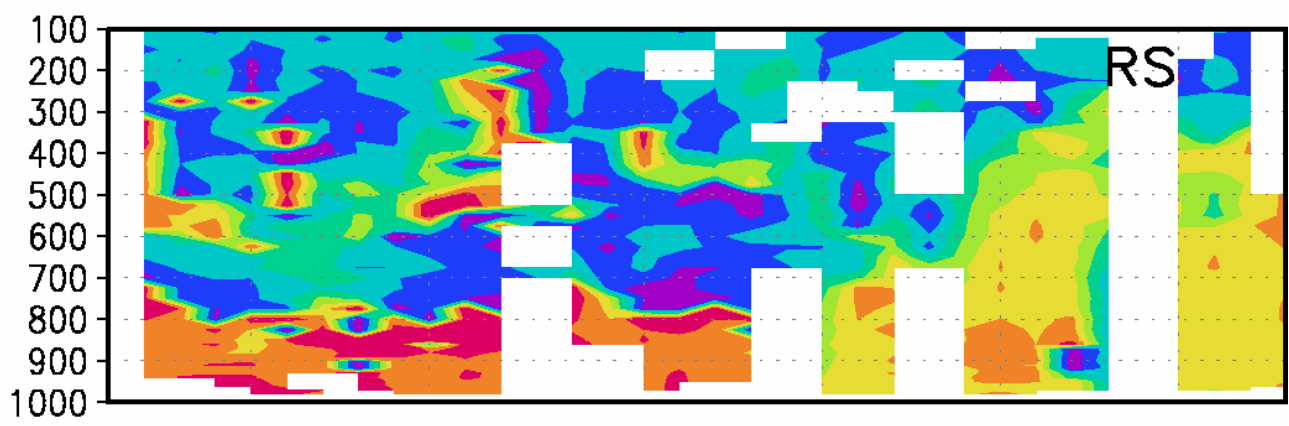
NCEP Under estimates the inversion strength



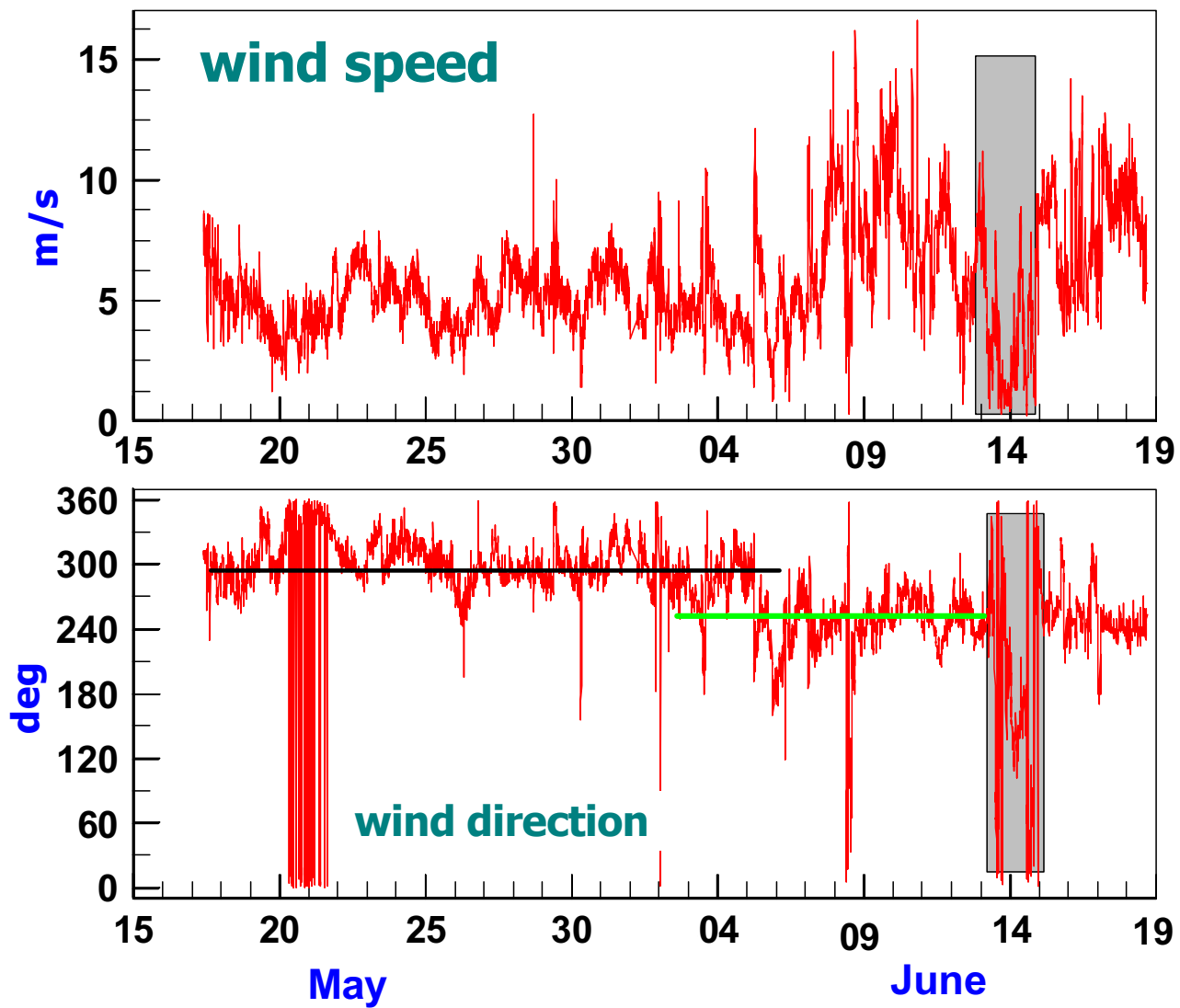
Humidity rapidly built up in 8 days
ABL - less moist in NCEP



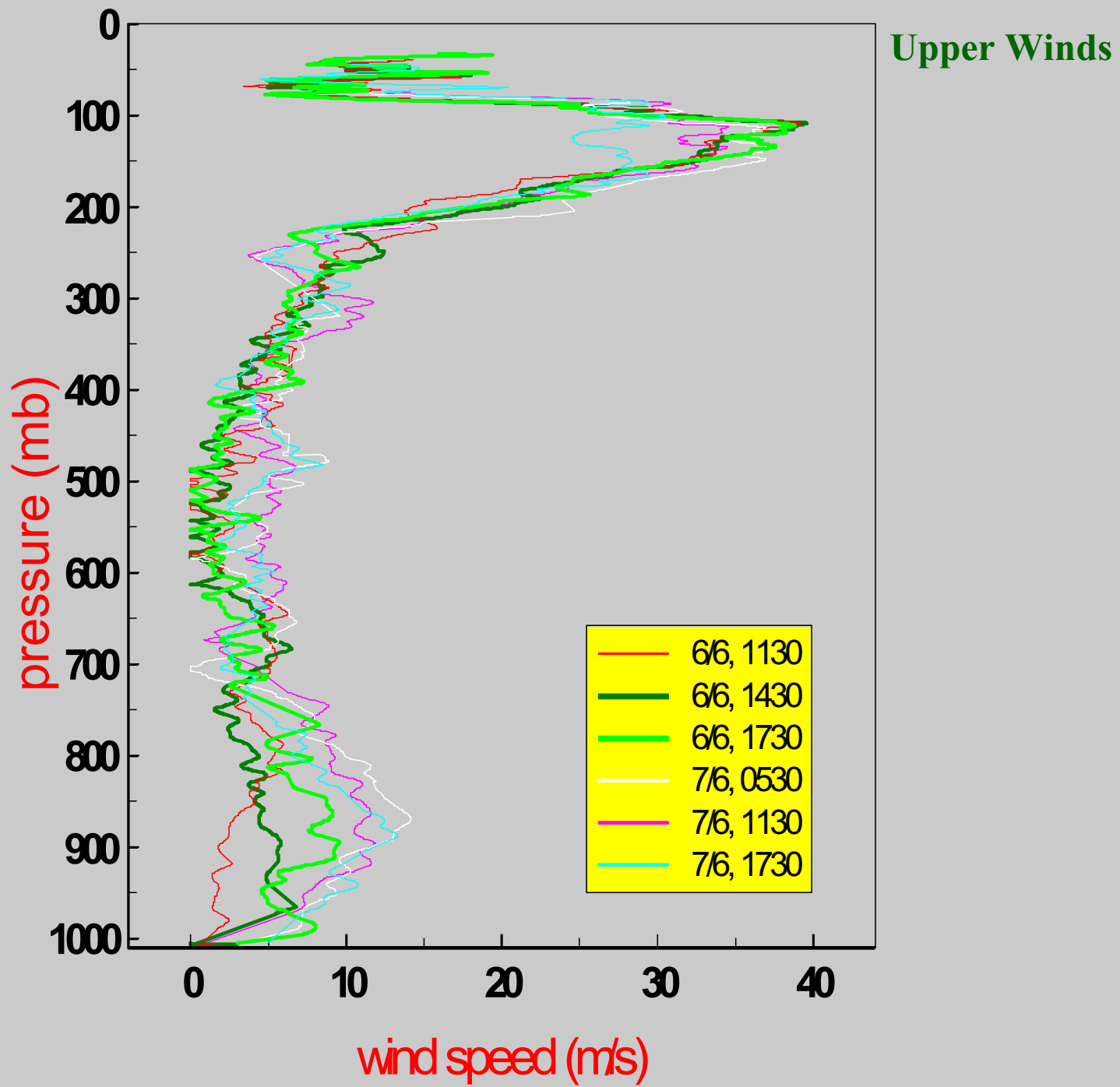
Wind Speed

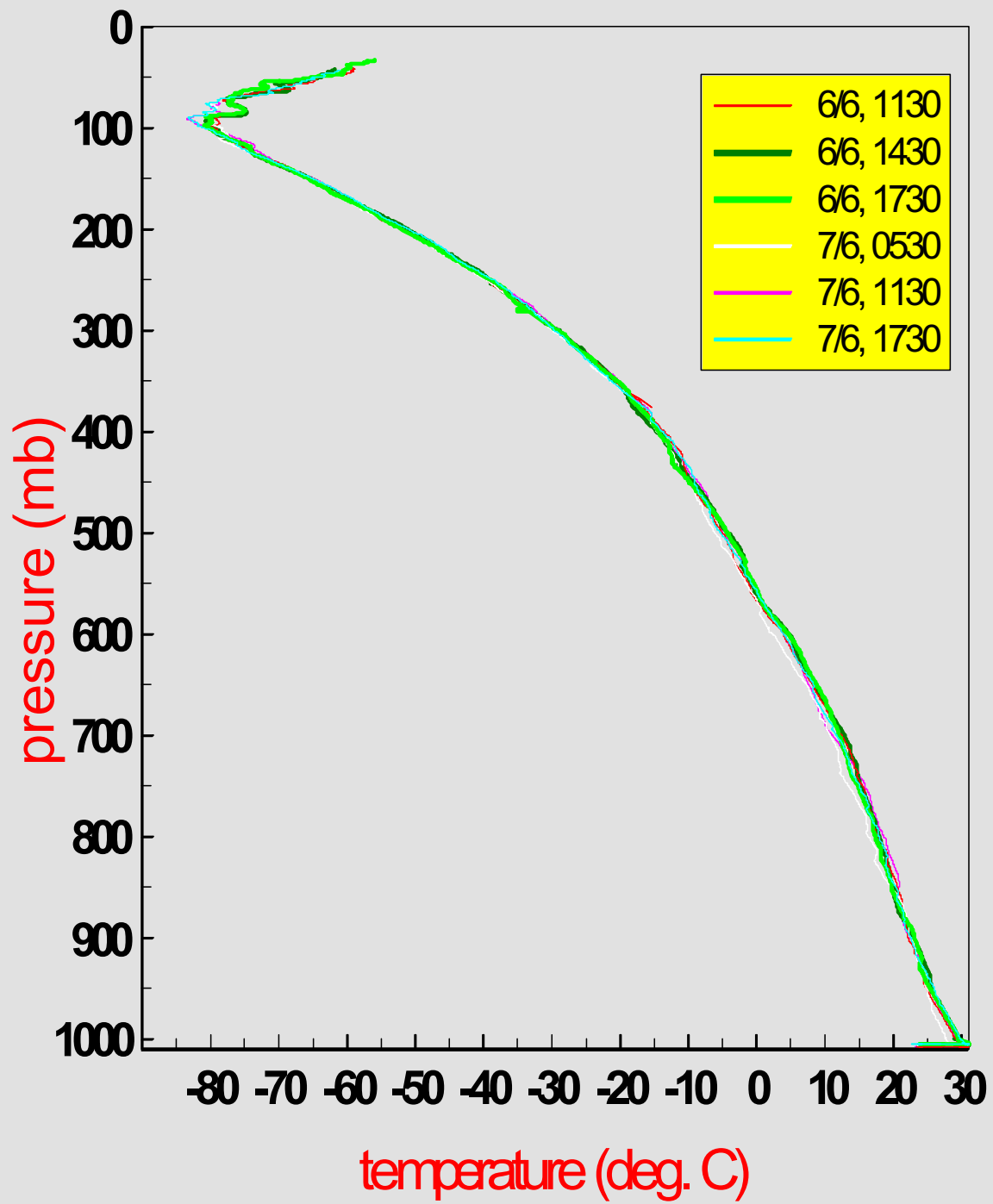


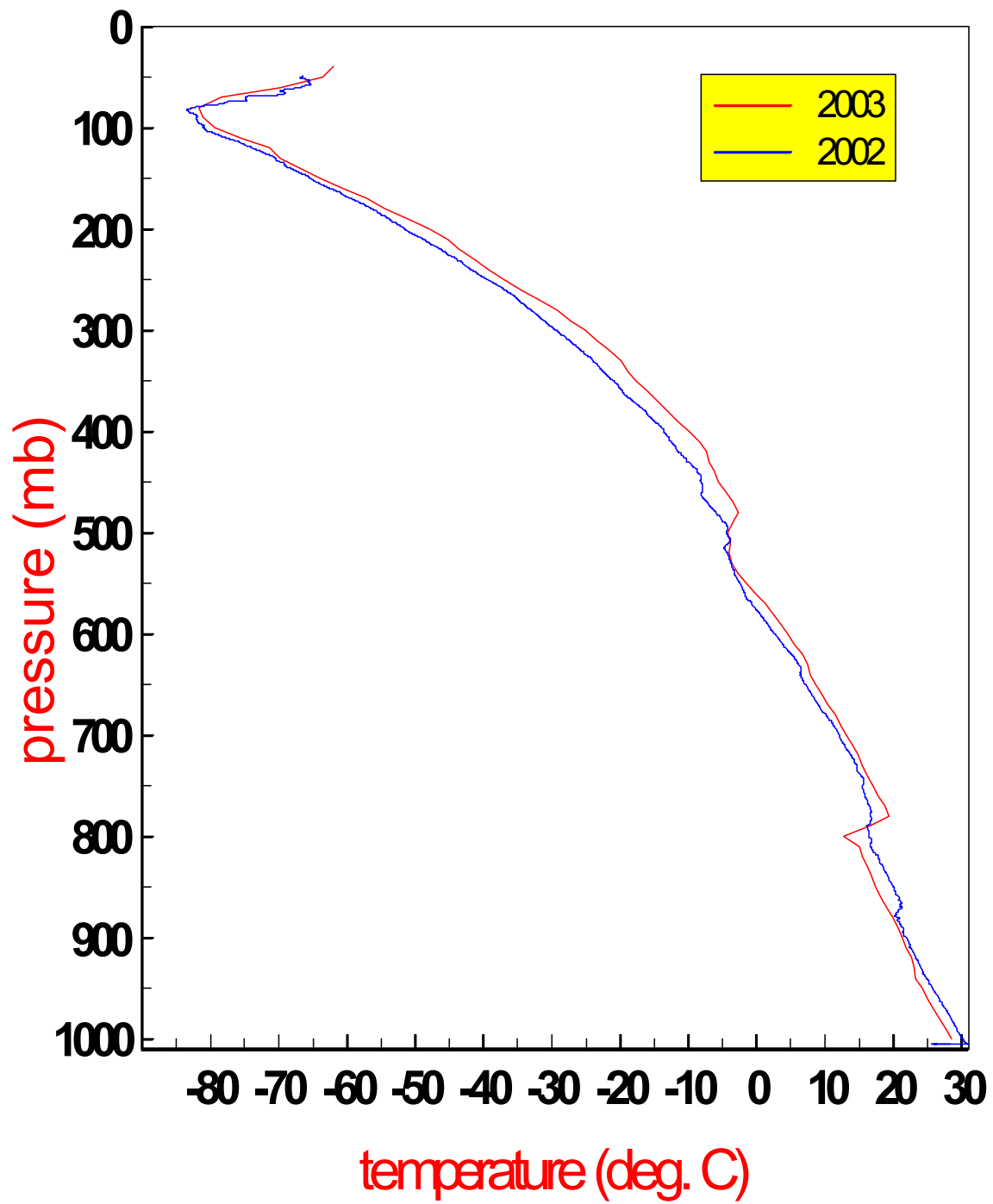
Wind Direction



SK193:







Some Remarks:

- 1. Strong diurnal variation in clouding & rainfall
(at least 8 Satellite Images /day)**
- 2. Cloud shape over the AS during 2003 monsoon
- long cloud bands, not seen in 2002.**
- 3. Over AS - what dictates convection?**
- 4. AWSs working fine at all 4 stations,
however, had serious problems at **Vengurla:**
- set alright
- added soil temperature & solar radiation**

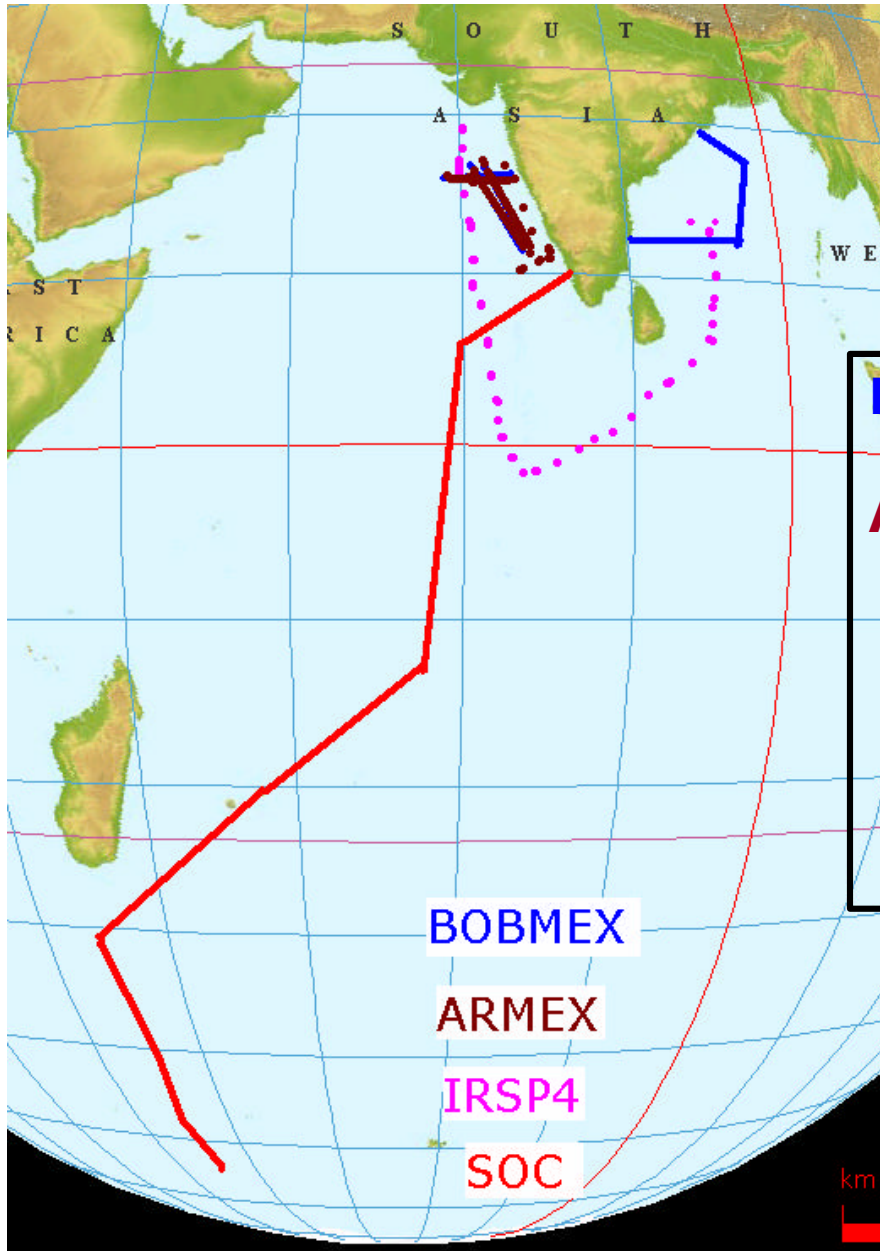
Fate of these AWS?

Need for a datalogger that can store 12 months data

**2 AWSs given to IAF - letter from DST
minutes of PAMC**



Clouds : Rolls?



BOBMEX - Jul-Agu 99

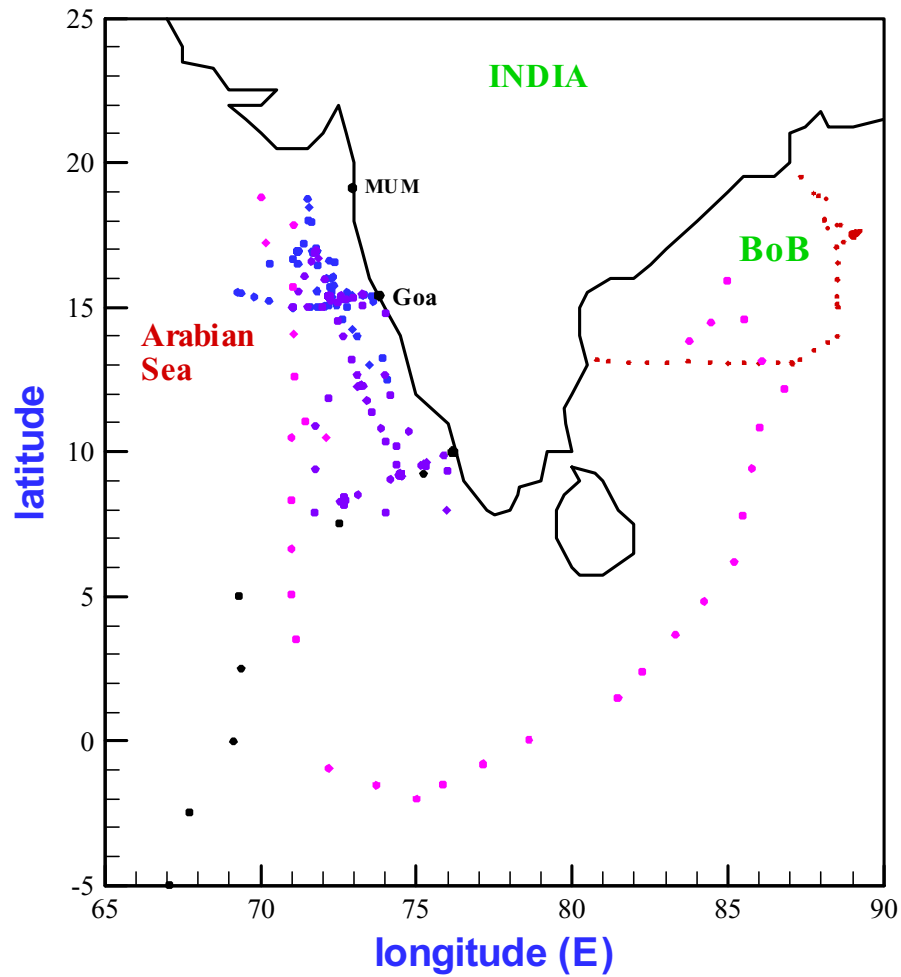
ARMEX:

1 : Jun-Aug 2002

2 : Mar-Jun 2003

IRSP4: Mar 2001

SOC : Jan-Feb 2004



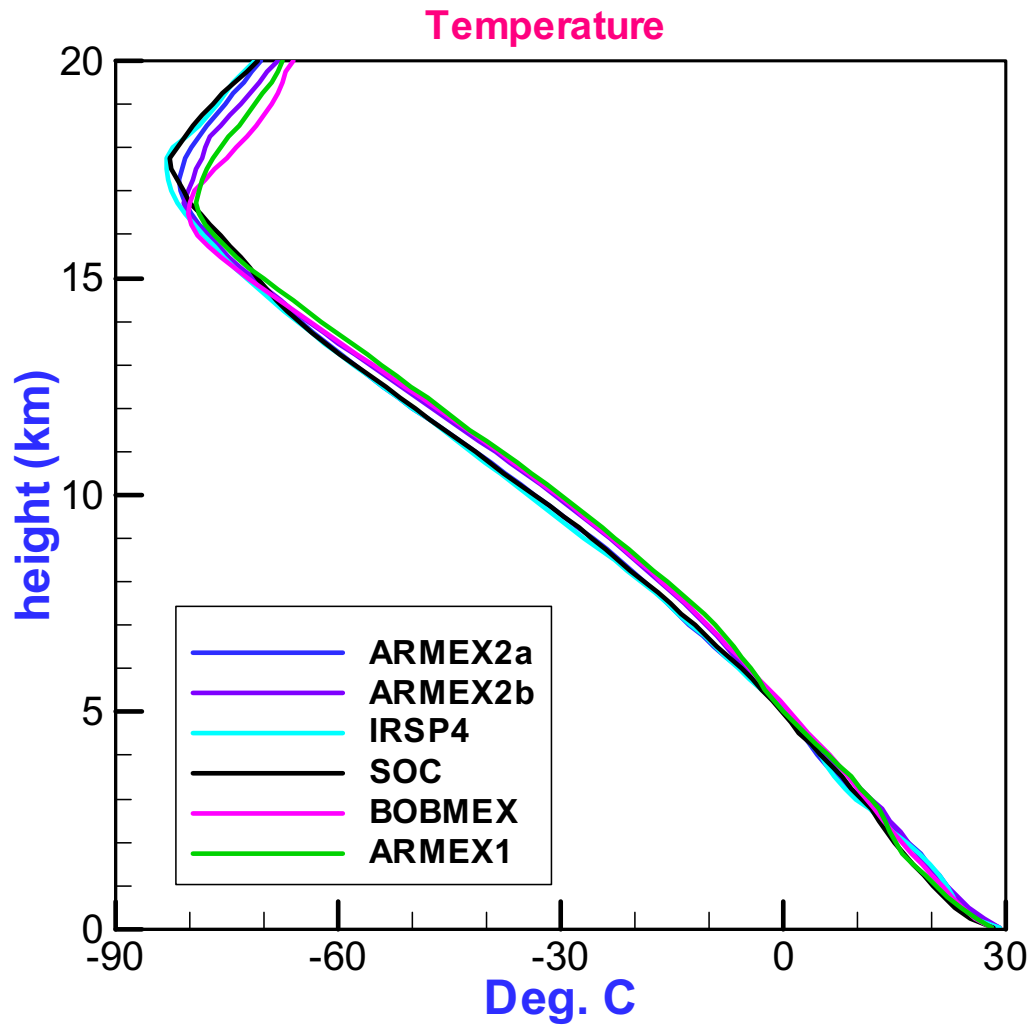
Radiosonde positions

Observations

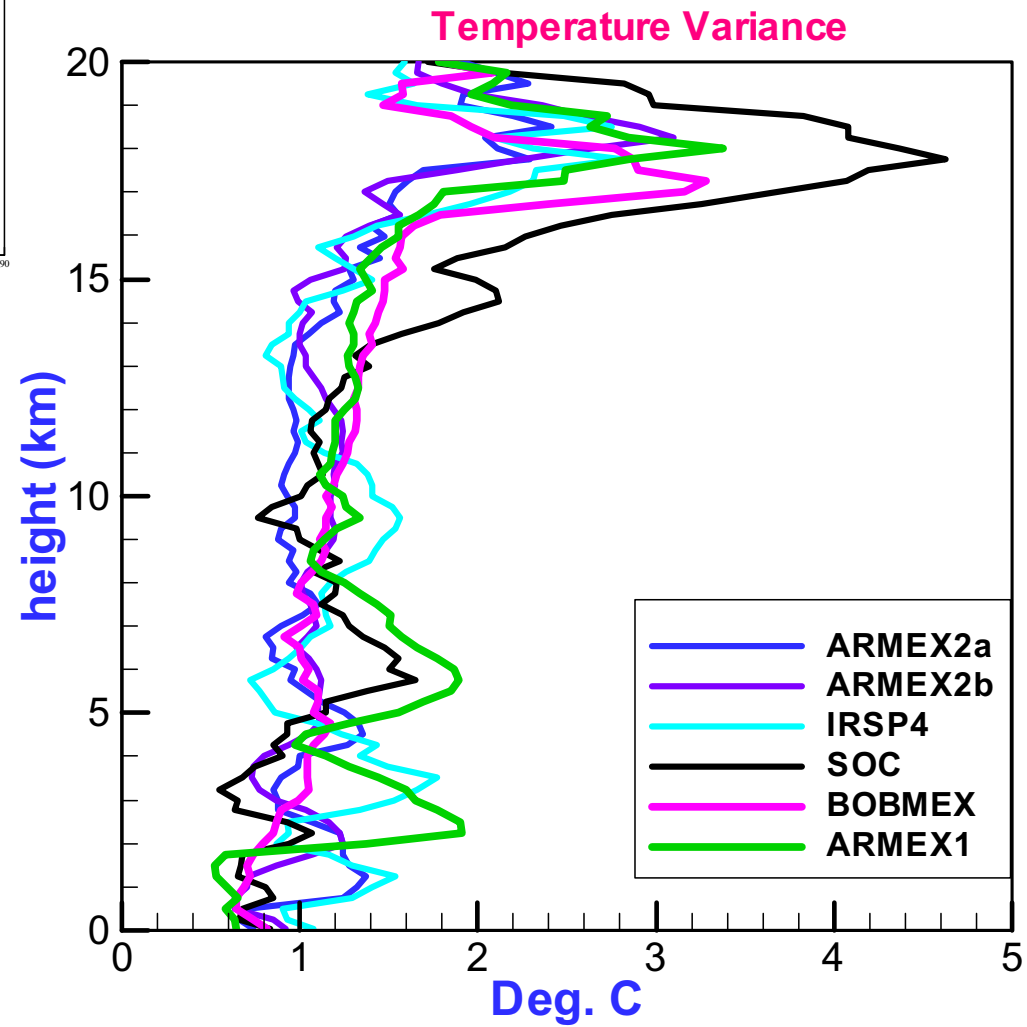
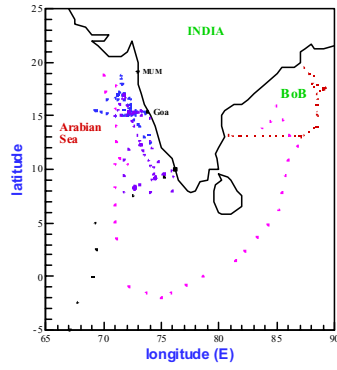
- 1. Mean**
- 2. Standard Deviation**

Models/Indirect

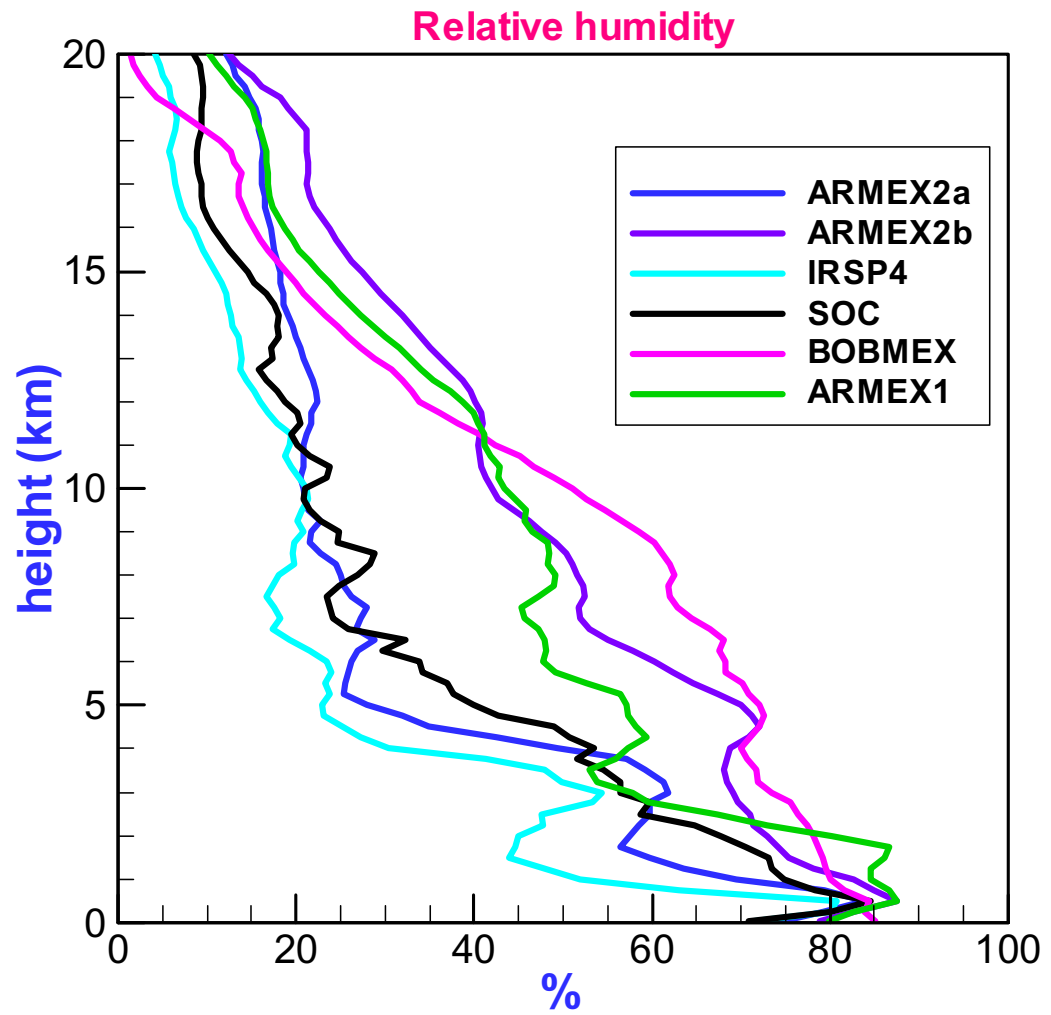
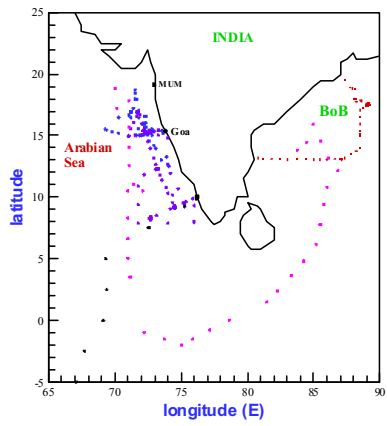
- 1. Sounders on Satellites**
- 2. Numerical Models**

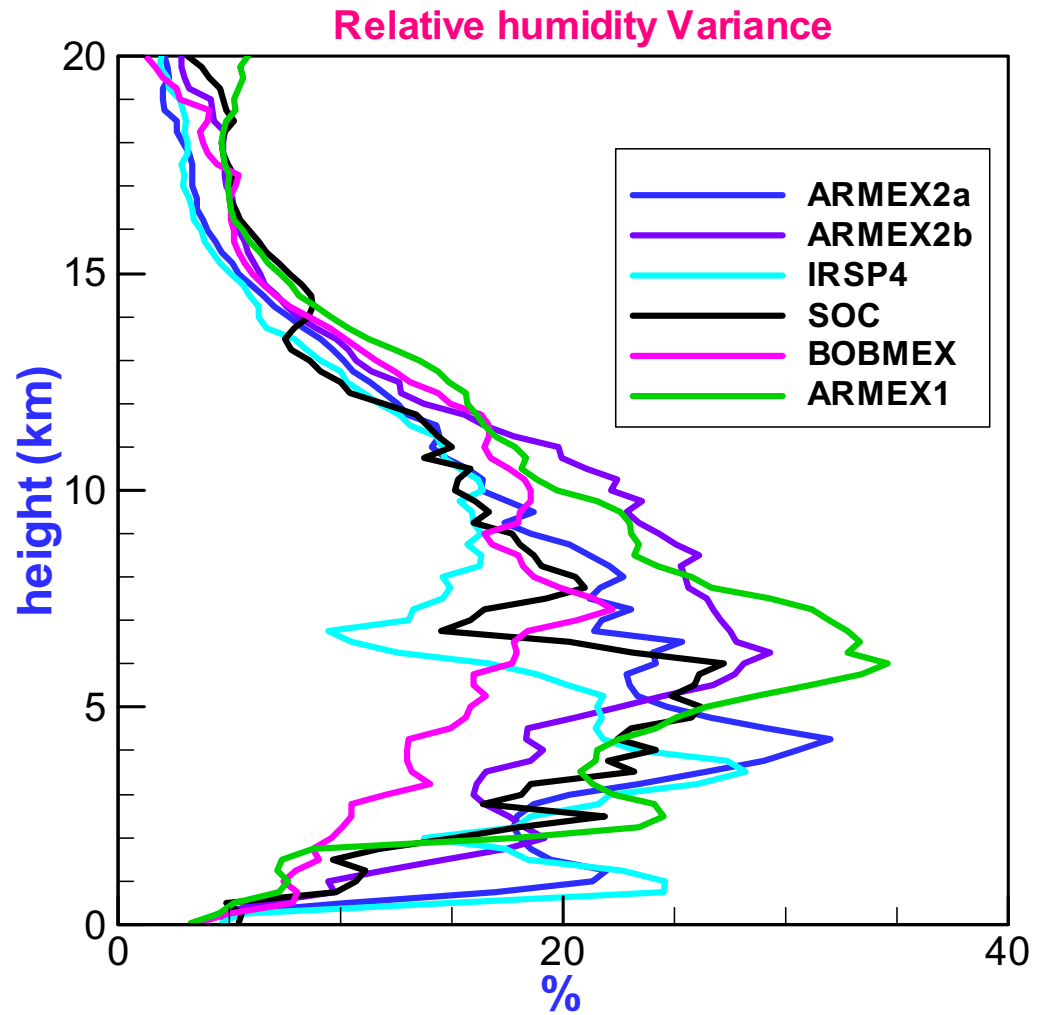
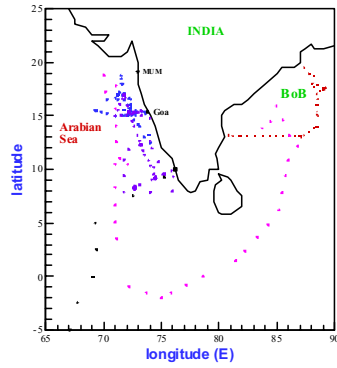


Average (Tropical) Soundings in the Indian Ocean

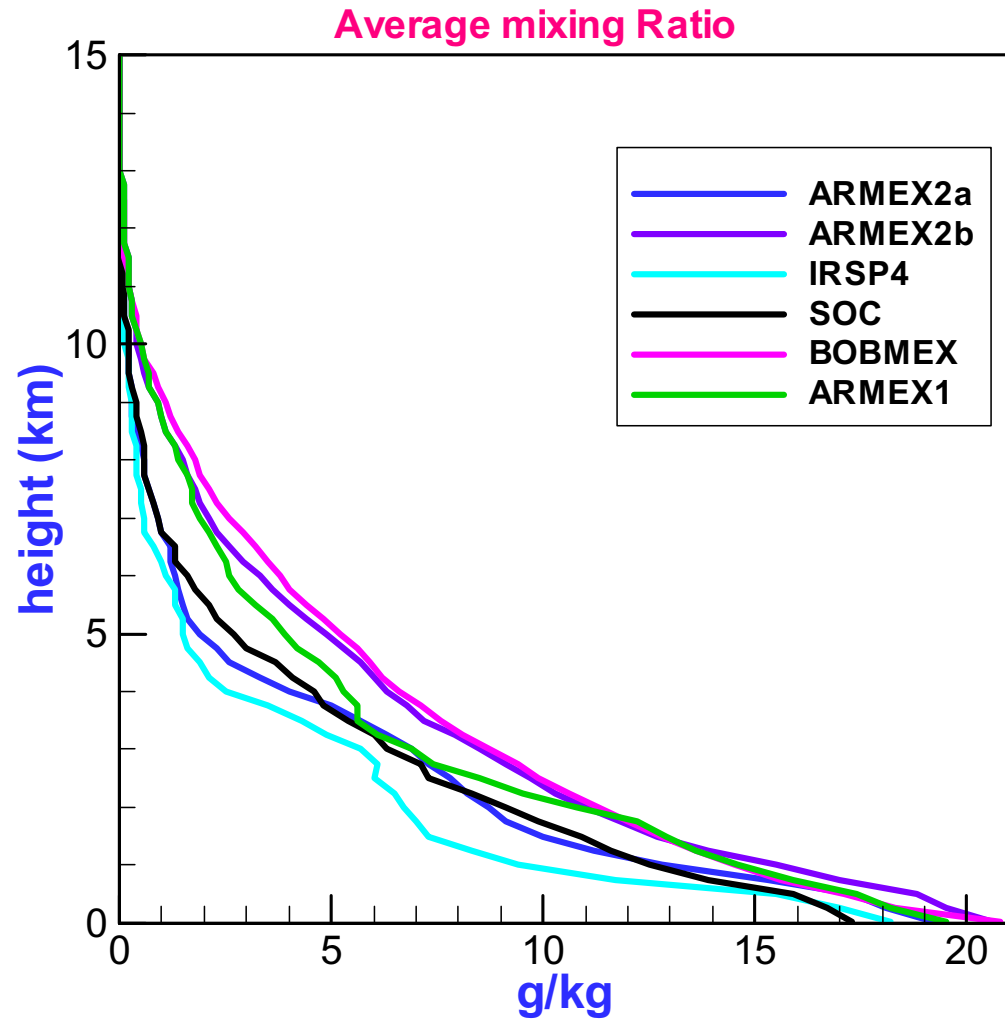
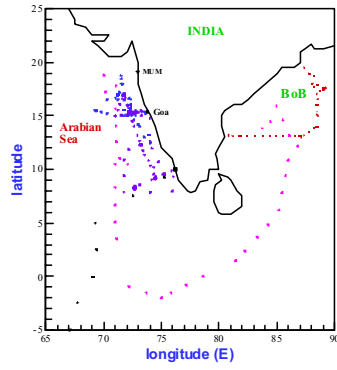


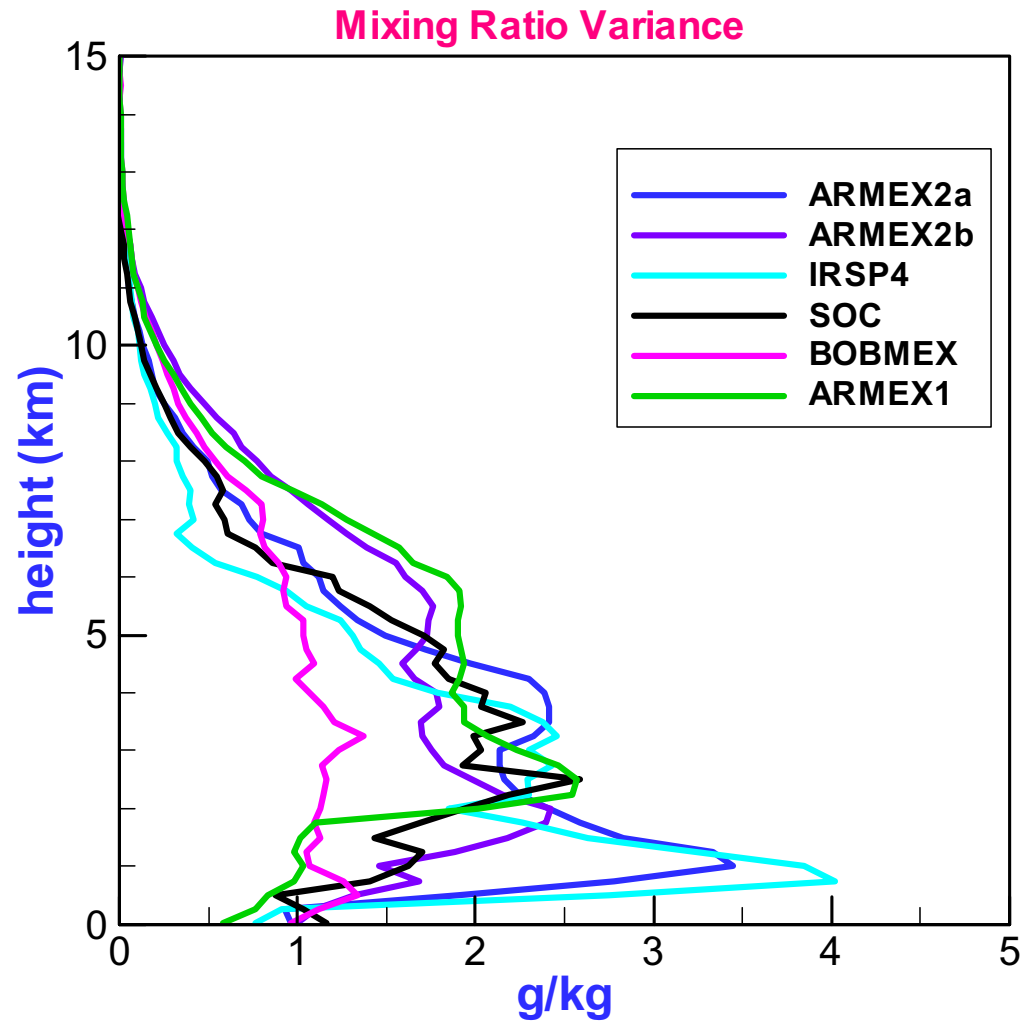
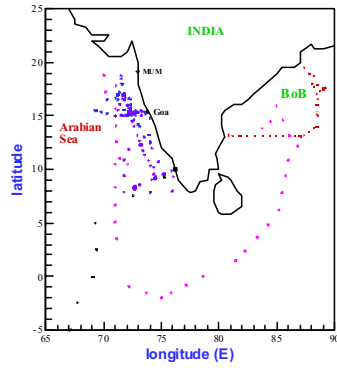
Lowest 15 km : T variance <2°C



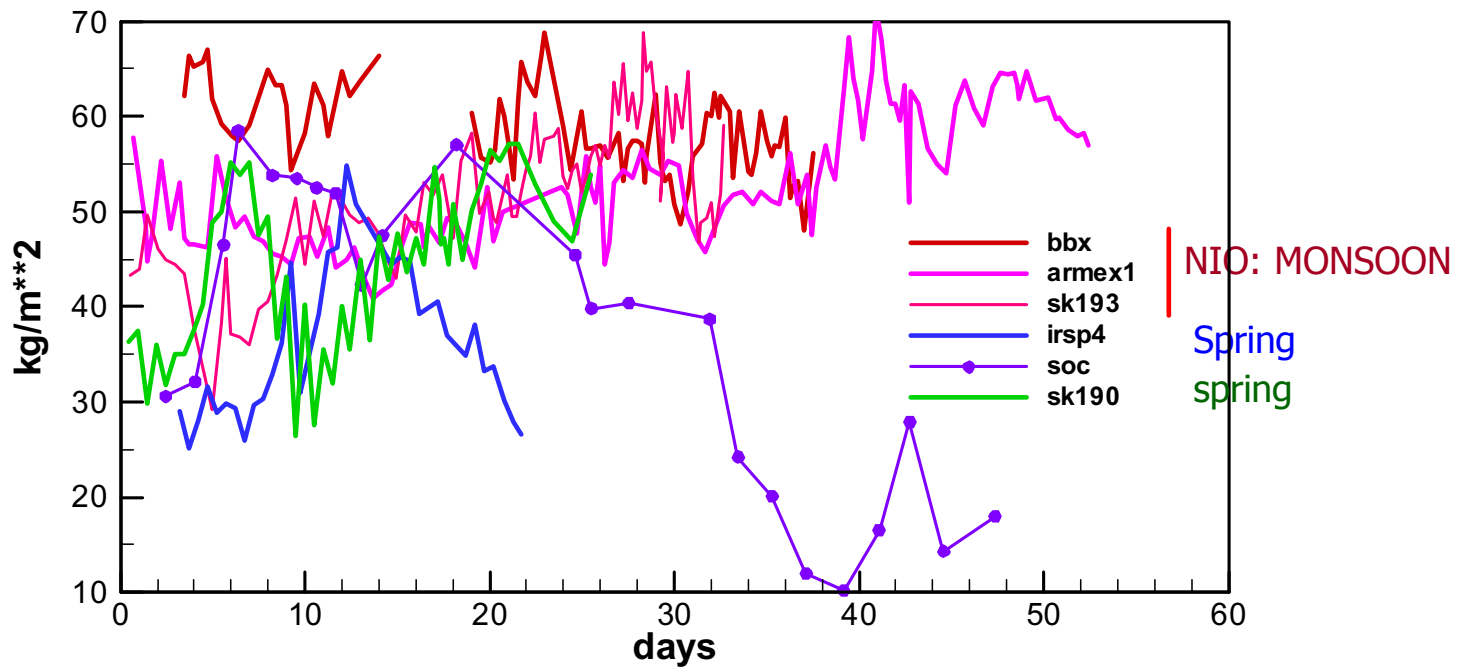


RH variance maximum in mid-troposphere





**Maximum mixing ratio variance: ~1-2 km (inversion)
3-4 km**



Integrated Water Vapour

