



# Saharan dust and IR radiation above the Island of Lampedusa



## The GAMARF Project

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Where in the world?

Lampedusa Island





VERTICAL  
PROFILES  
ABOVE THE  
SEA UP TO  
4000 m

LAMPEDUSA  
ISLAND (50 m)

10 km \* 3 km



# THE PLATFORM





# D- MIFU

**Microlight aircraft**

**Ceiling 4500 m**

**Cruise speed 25 m/sec**

**Payload 80 kg**

**Endurance > 5 h**



## Ozone

Act. Rad. 300 nm JO1D

Act. Rad. 380 nm JNO2

Global radiation

Albedo 400, 550, 650, 990 nm

**Spectral Actinic Flux**

**Infrared**

Temperature

Humidity

Pressure

Position

Wind (horizontal)

Surface Temperature

CN / number

Aerosol / size distr.

Submicron aerosol size distribution (SMPS) 4.5-350 nm

Scatt. coeff. / visibility

Absorption coefficient

Turbulence, 3D windvector

Attitude / Heading

## UV-Photometer

2 Filterradiometers

2 Filterradiometers

2 LICOR Pyranometers

2 four channel irradiance sensors

**Spectroradiometer**

**CGR4, Eppley Pyrgeometer**

Pt 100

Chilled mirror

GPS

GPS/Compass/INS

IR sensor

TSI 3010

OPC, 300 nm – 20 um

SMPS) 4.5-350 nm

HSS-AVMIII, 870 nm

Magee 7 wavelength Aethalometer

5 hole noseboom probe

Oxford Tech. INS





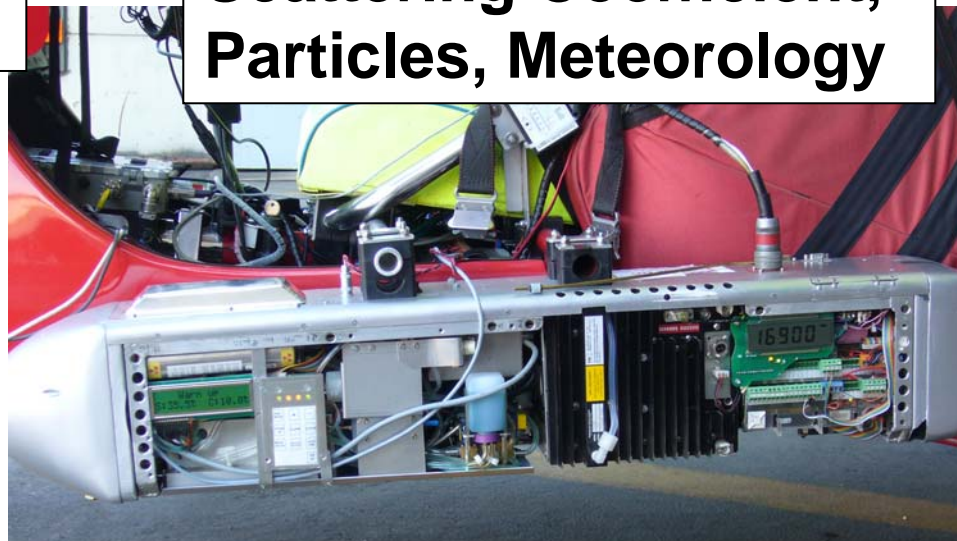
**Radiation Sensors ↓ dn  
180 ° field of view**



**+ spectral and global irradiance**



**Ozone, Radiation ↑ up,  
Scattering Coefficient,  
Particles, Meteorology**



**Aerosols, fast CPC, Aethalo.  
Size distribution 5 nm – 20 μm**

**Radiation Sensors for  
GAMARF installed on  
gimballed platforms  
+/- 0.3 degrees**



**Upwelling, IR,  
irradiance, spectral  
actinic flux**



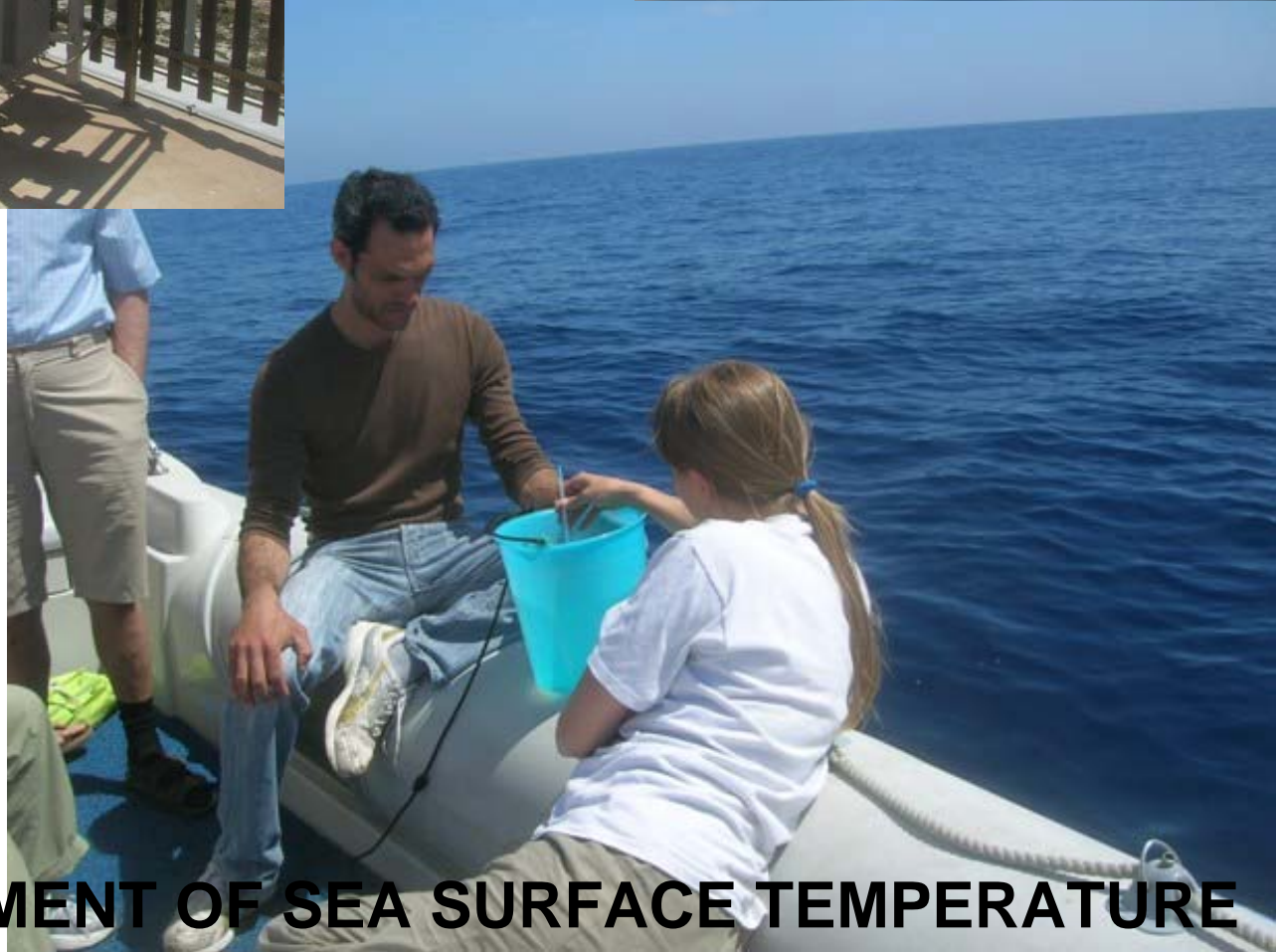
**LAMPEDUSA GAW STATION  
AEROSOL-LIDAR, RADIATION  
AEROSOL in-situ**



**CARETTA CARETTA**



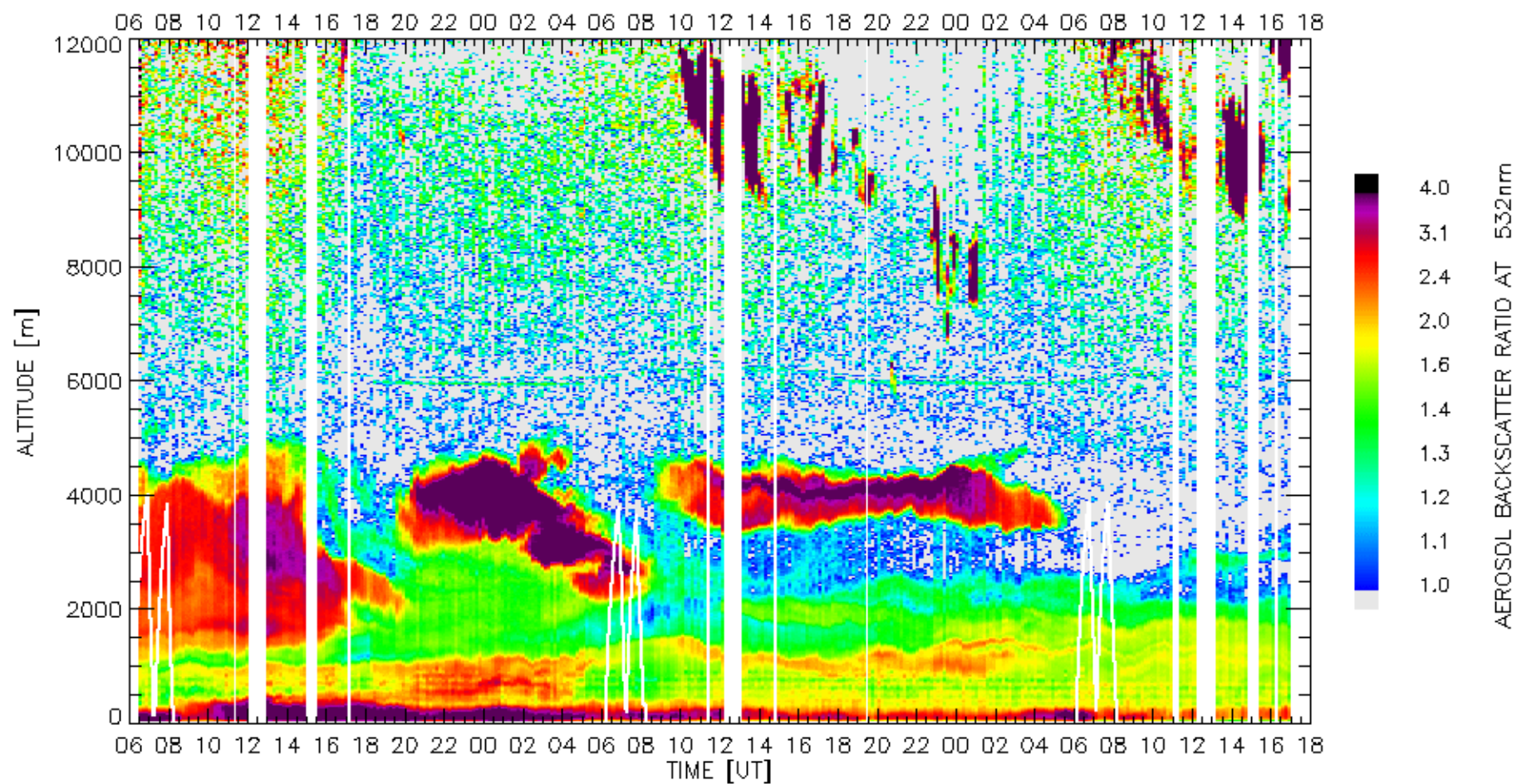
**GROUND BASED  
MEASUREMENT**



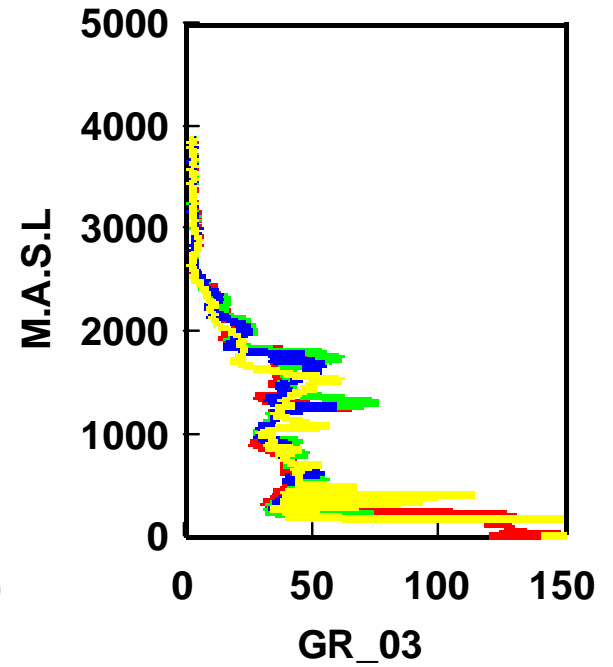
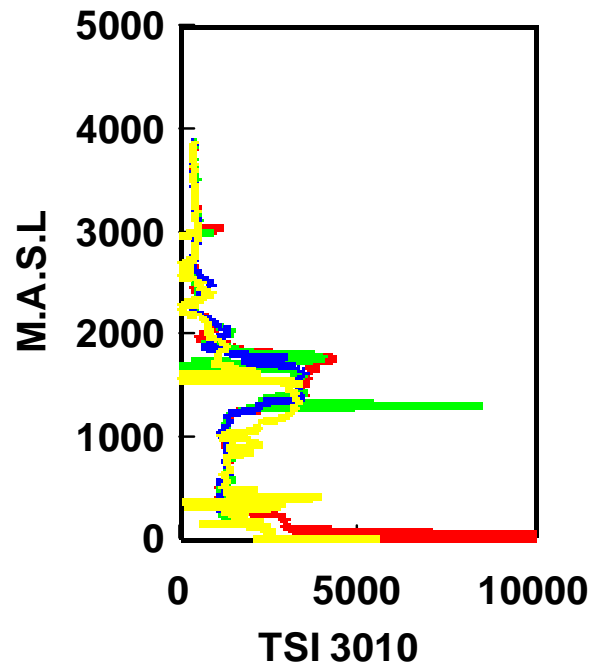
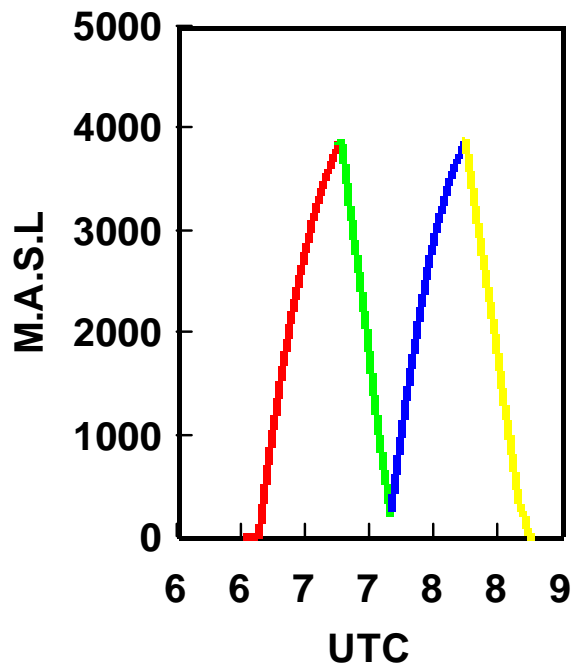
**MEASUREMENT OF SEA SURFACE TEMPERATURE**

LAMPEDUSA (35.5°N, 12.6°E)

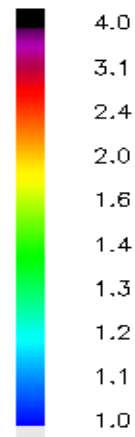
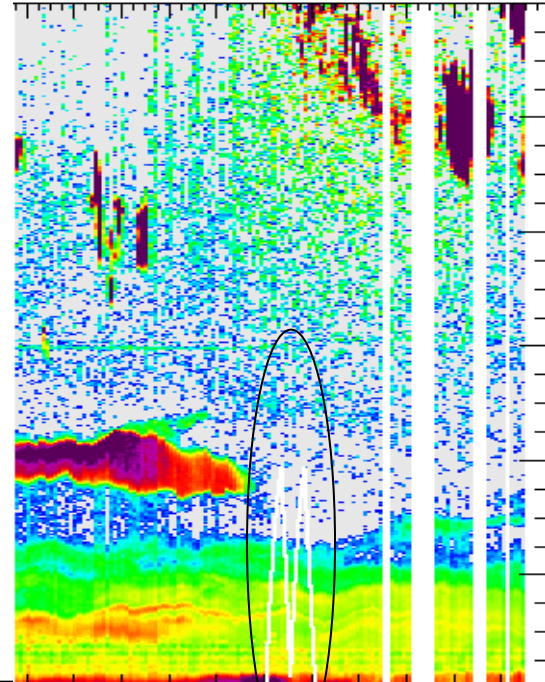
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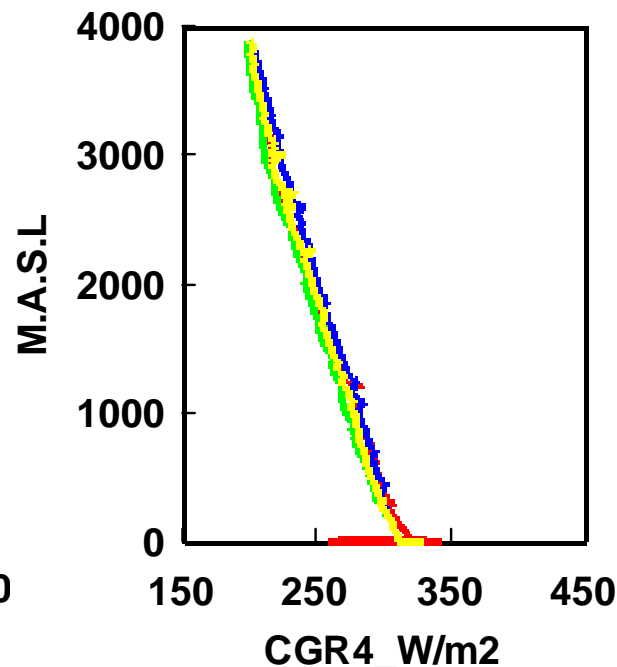
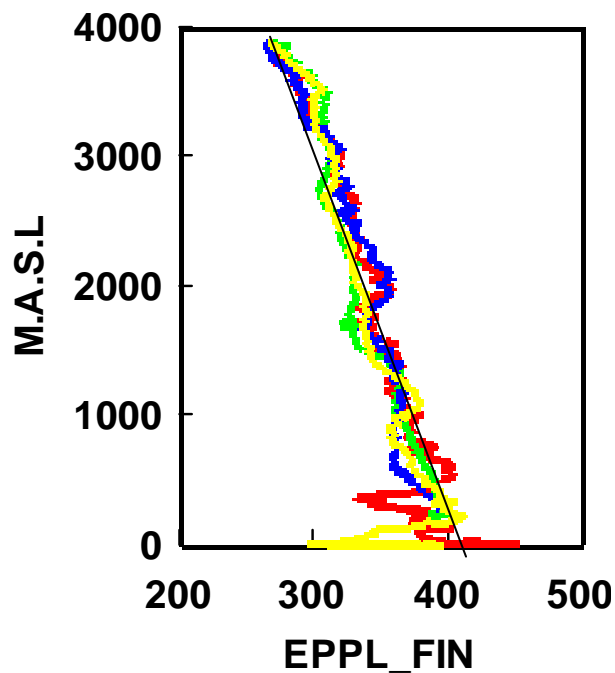
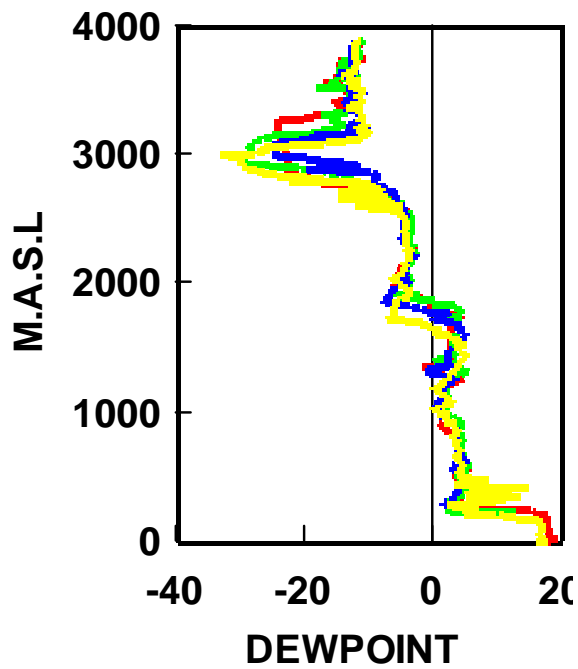
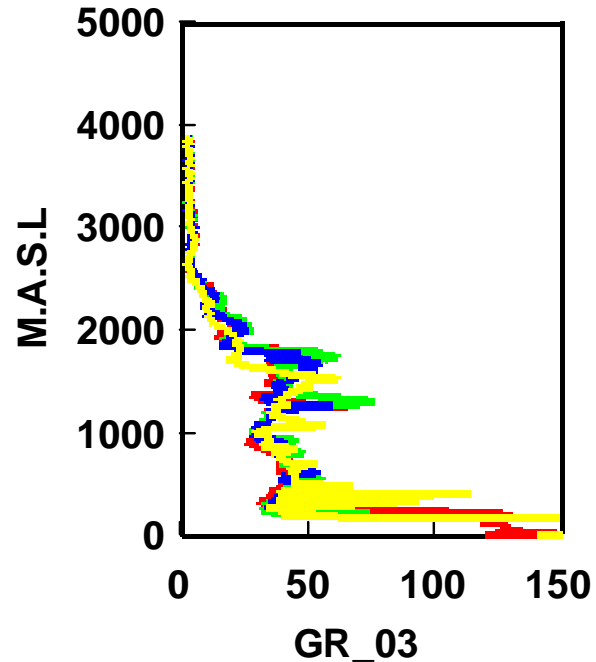
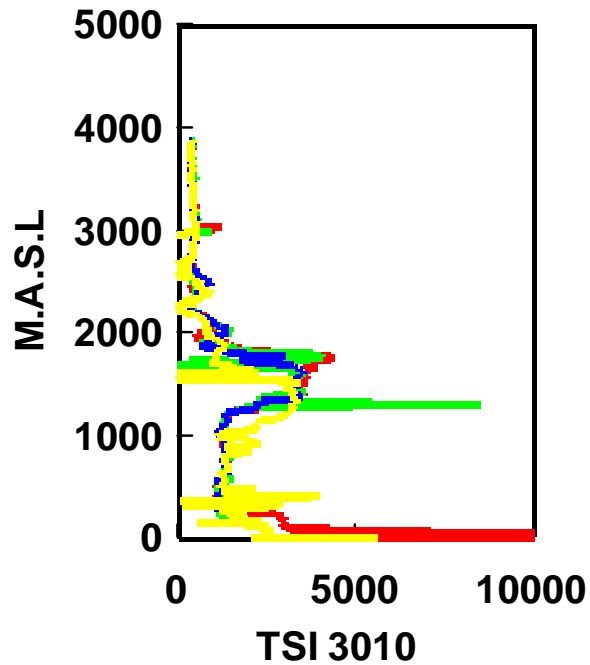
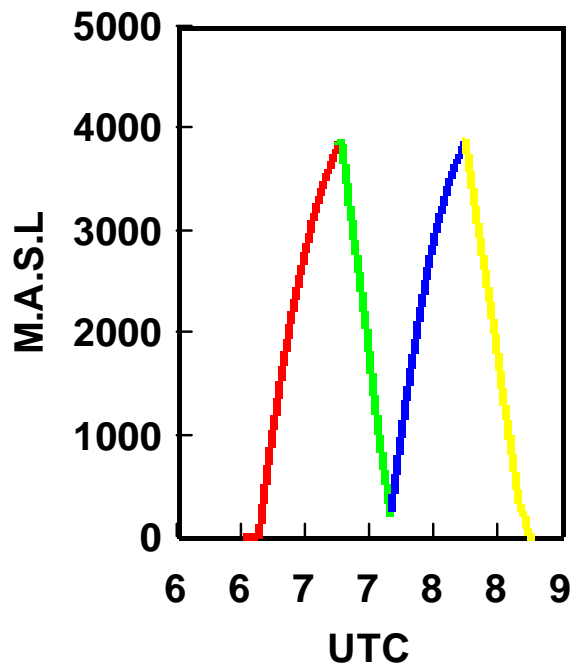




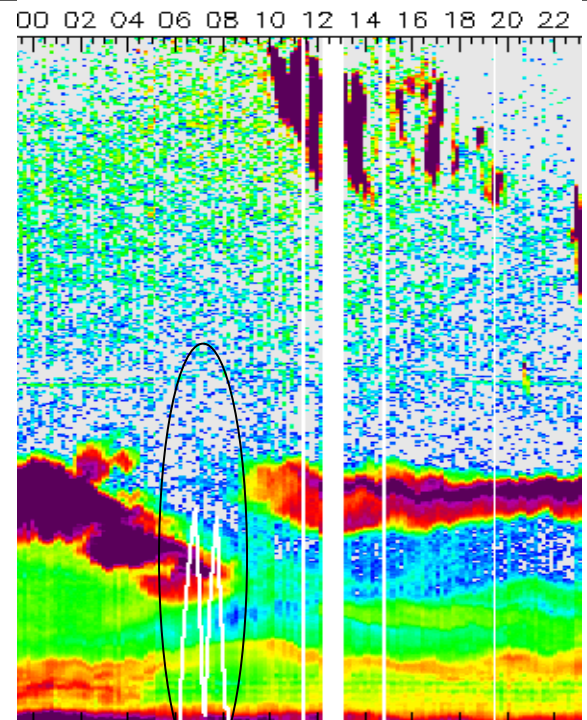
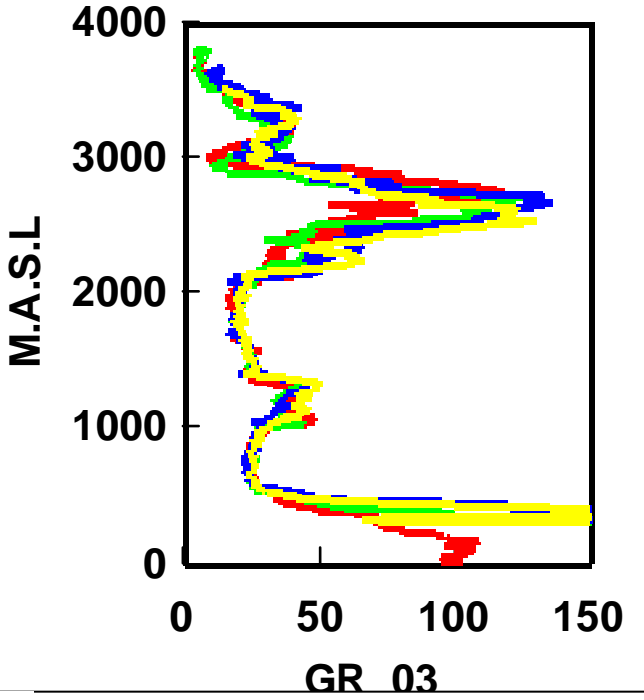
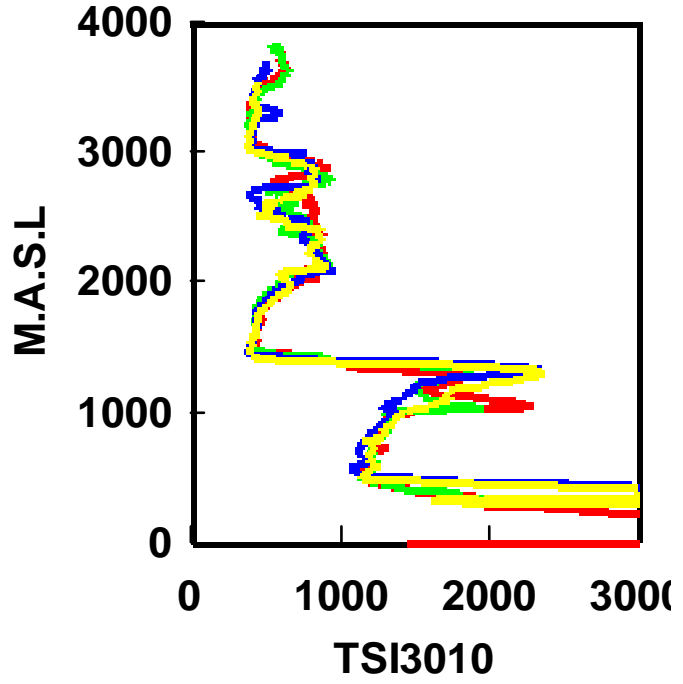
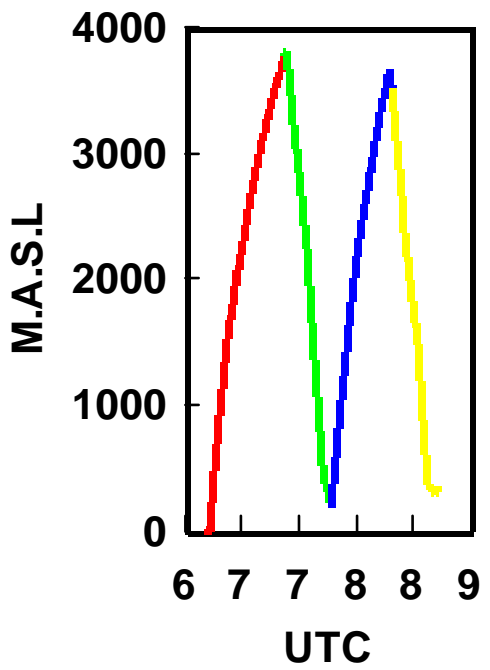


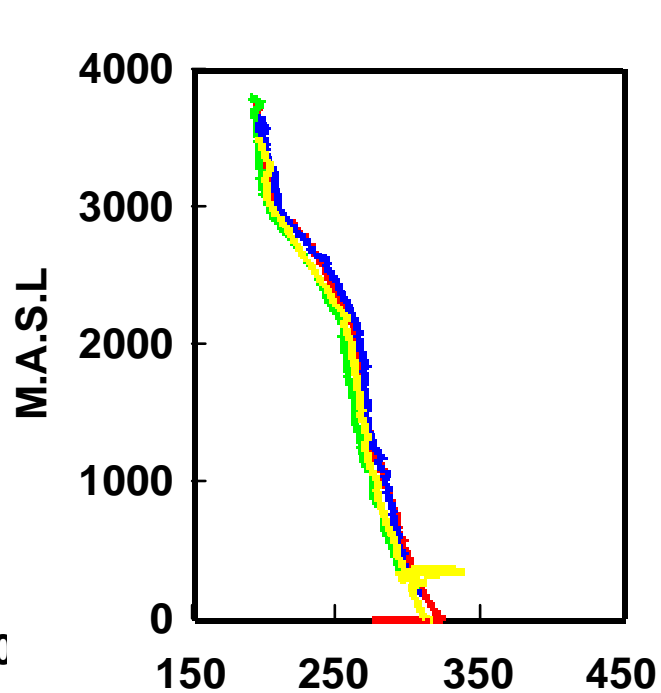
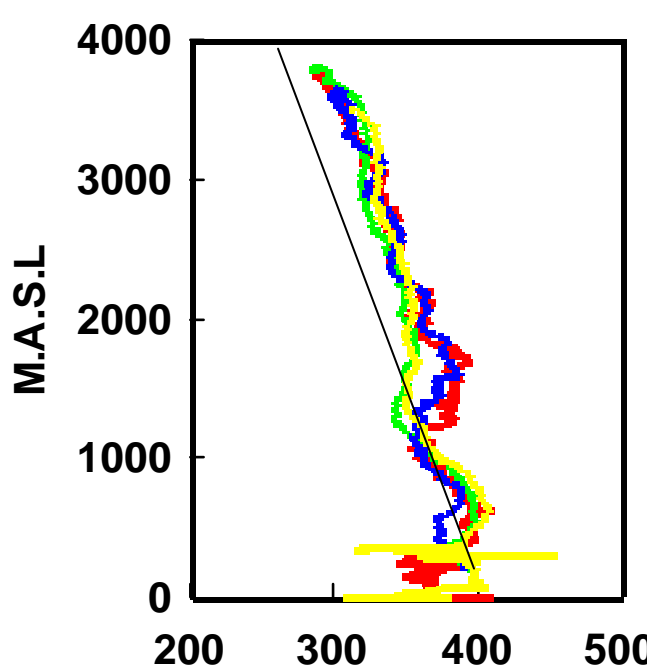
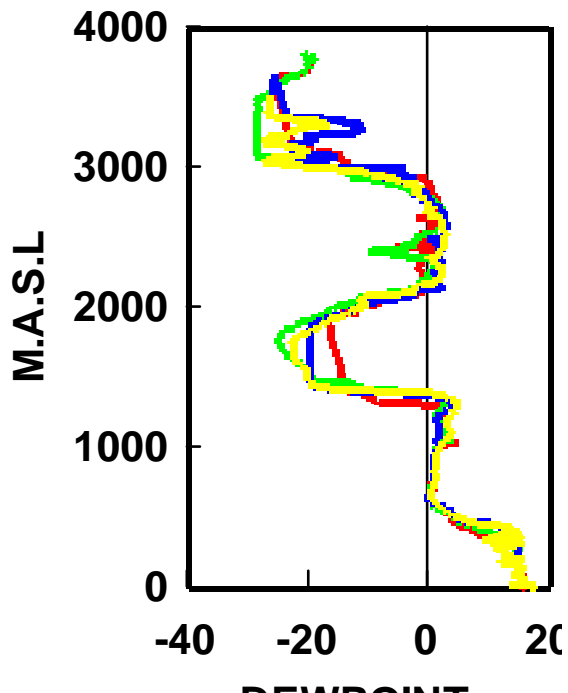
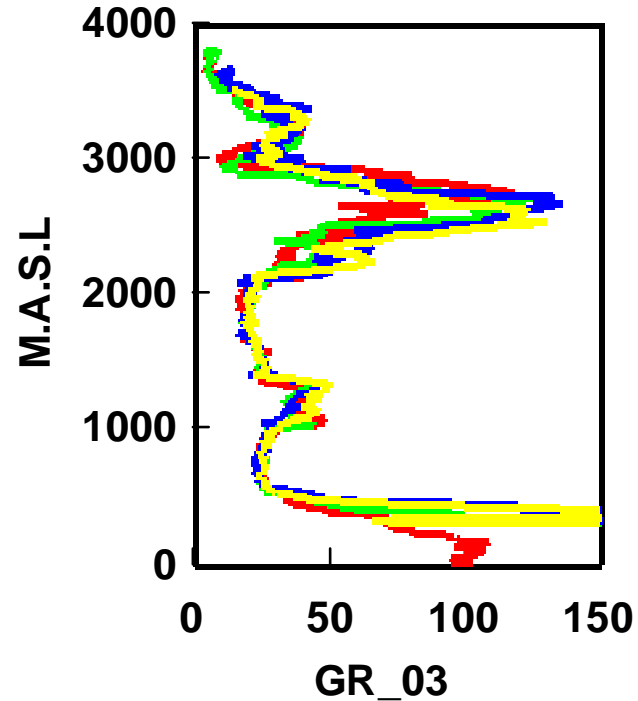
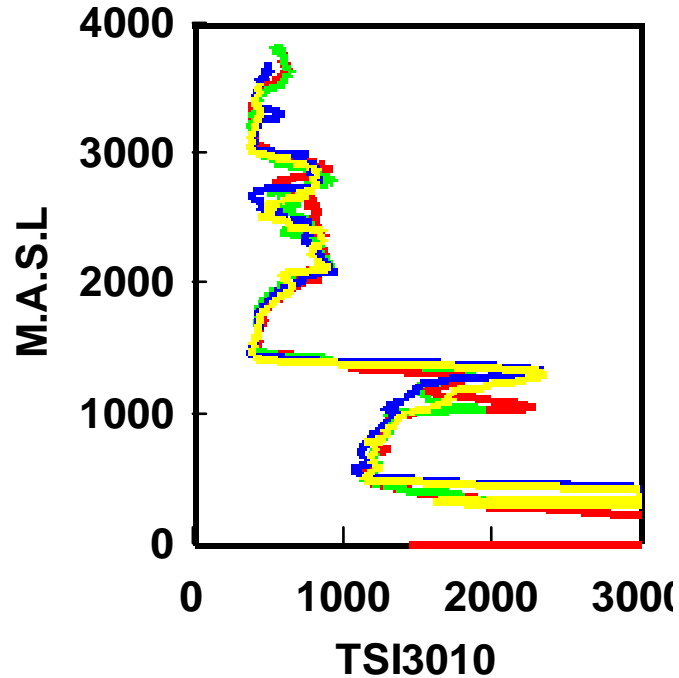
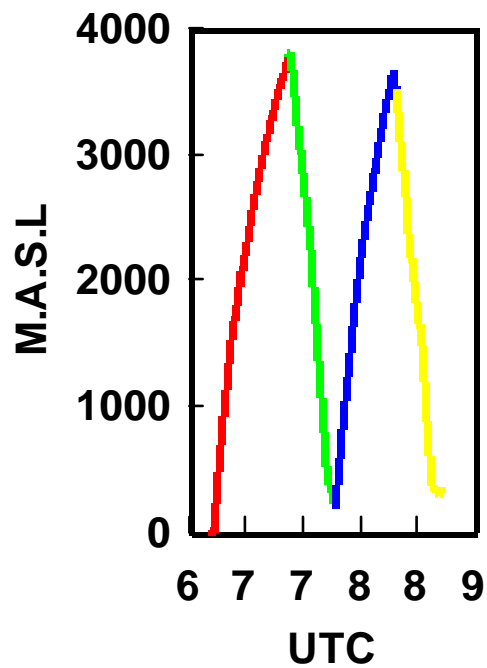
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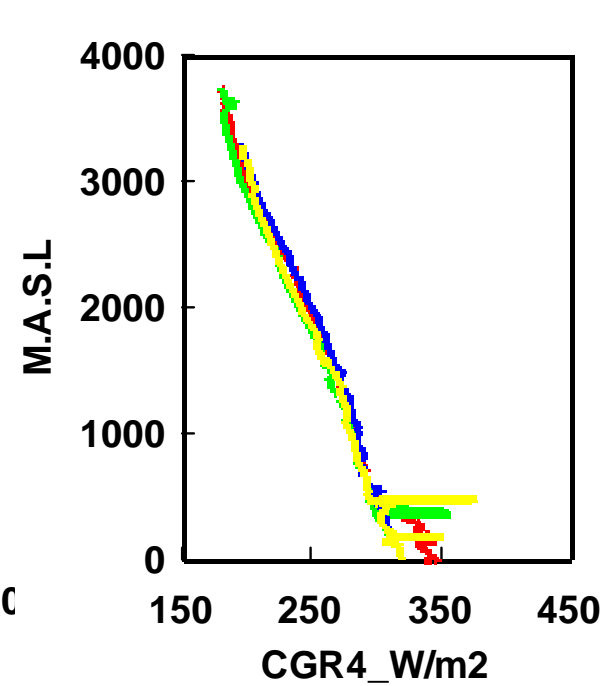
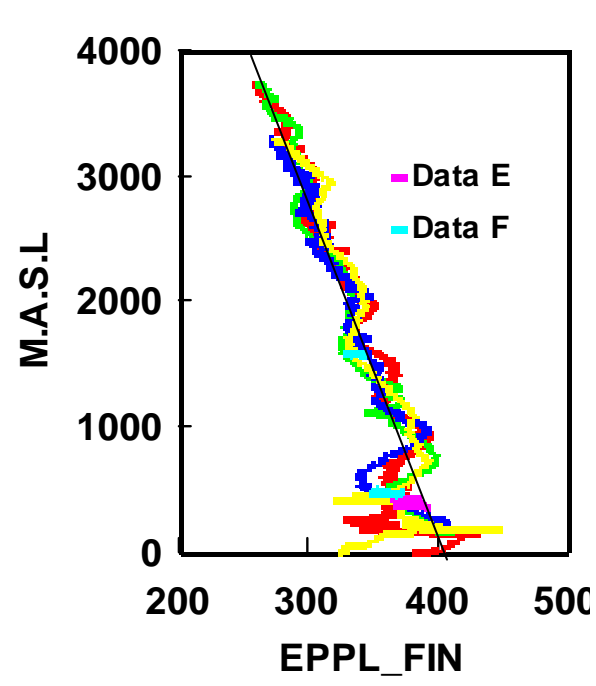
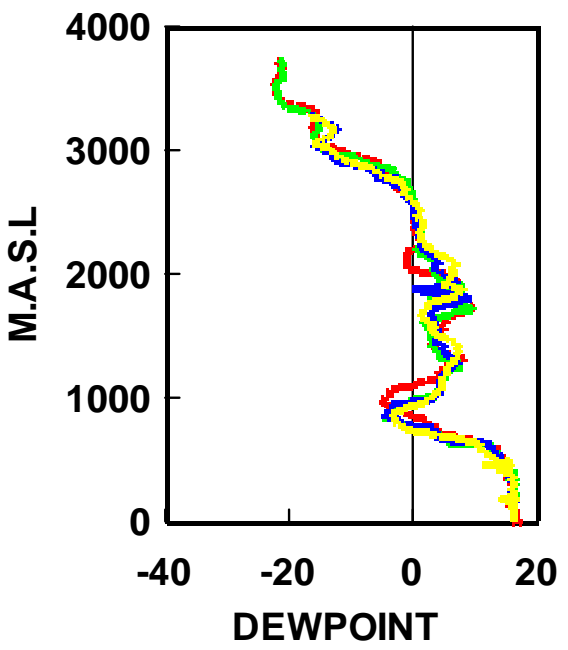
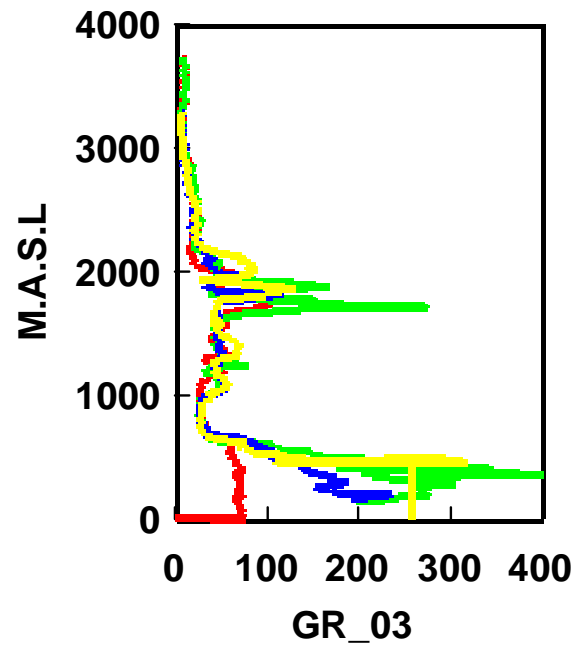
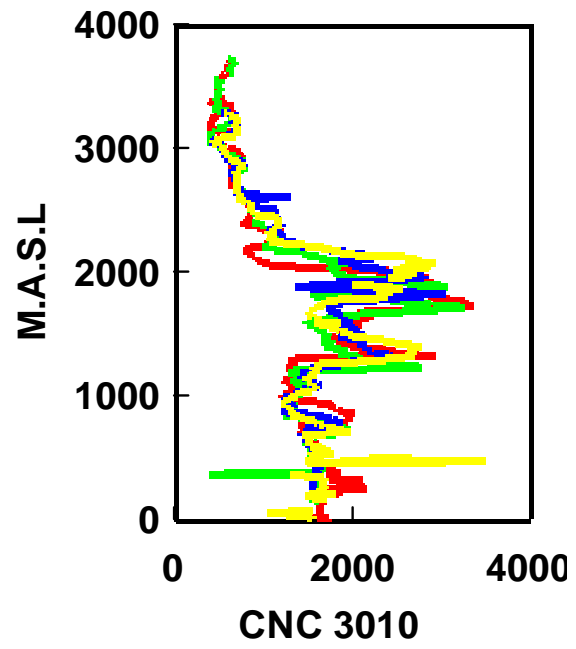
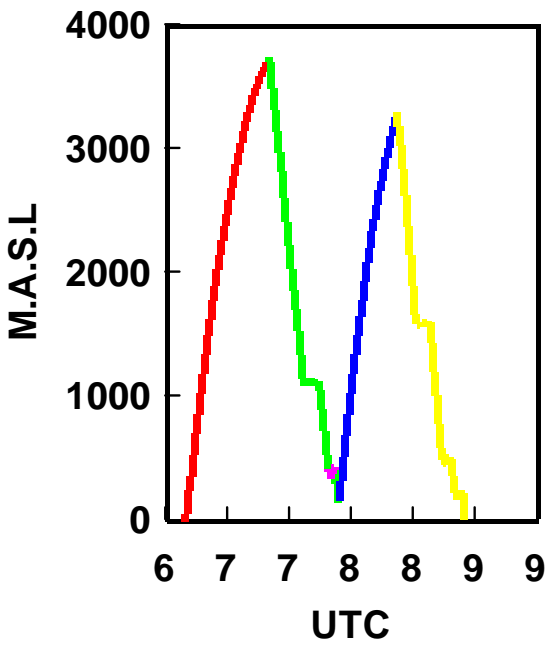














# **SUMMARY**



**DUST LAYERS MODIFY THE IR RADIATION PROFILES**

**UPWELLING IR IS INCREASED**

**DOWNWELLING SHOWS CURVATURE**

**WATER VAPOR INFLUENCE HAS TO BE CORRECTED**

**(MODEL CALCULATION AND RAWIN SONDE DATA)**

**SHORTWAVE SPECTRAL AND SPECTRAL ALBEDO DATA  
ARE AVAILABLE, FINAL DATA SET IN NOVEMBER**

***THANK YOU FOR YOUR ATTENTION***



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