

E-ICES 2

*“International Center for
Earth Sciences”*

2° Encuentro

2006

“COMPARISON OVER SOUTHERN SOUTH AMERICA USING GPS, REANALYSIS AND RADIOSONDE DATA”

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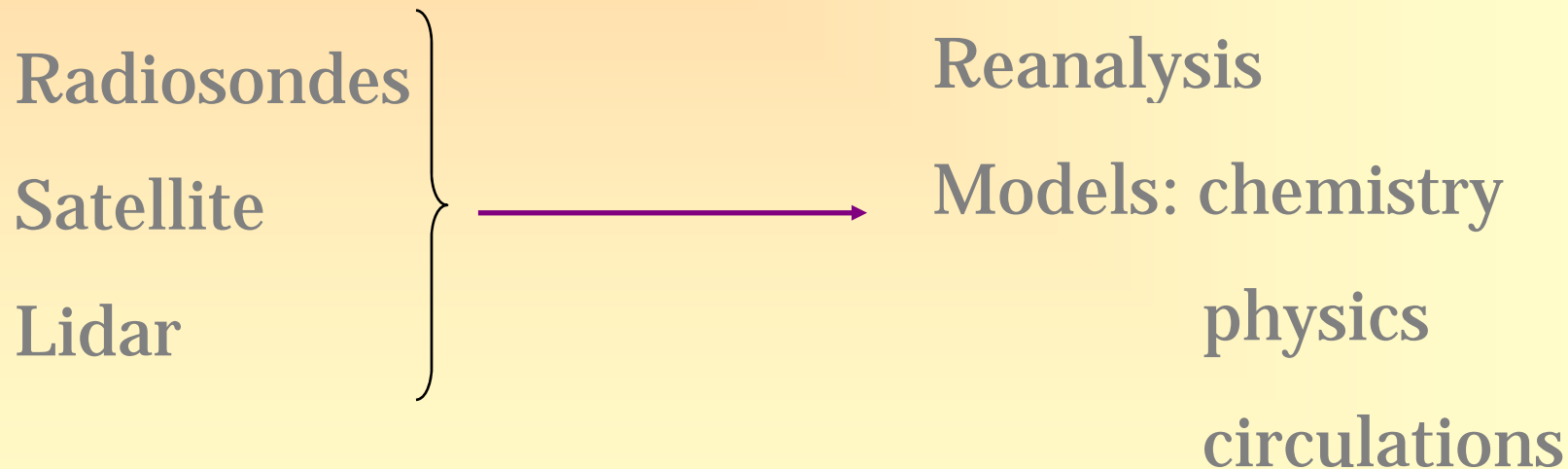
*Programa de Estudios de Procesos Atmosféricos
en el Cambio Global (PEPACG)*

UCA/CONICET

Understanding the atmosphere

Climate system  Nonlinear character

Long-term observations of parameters



Sounding the atmosphere using satellites

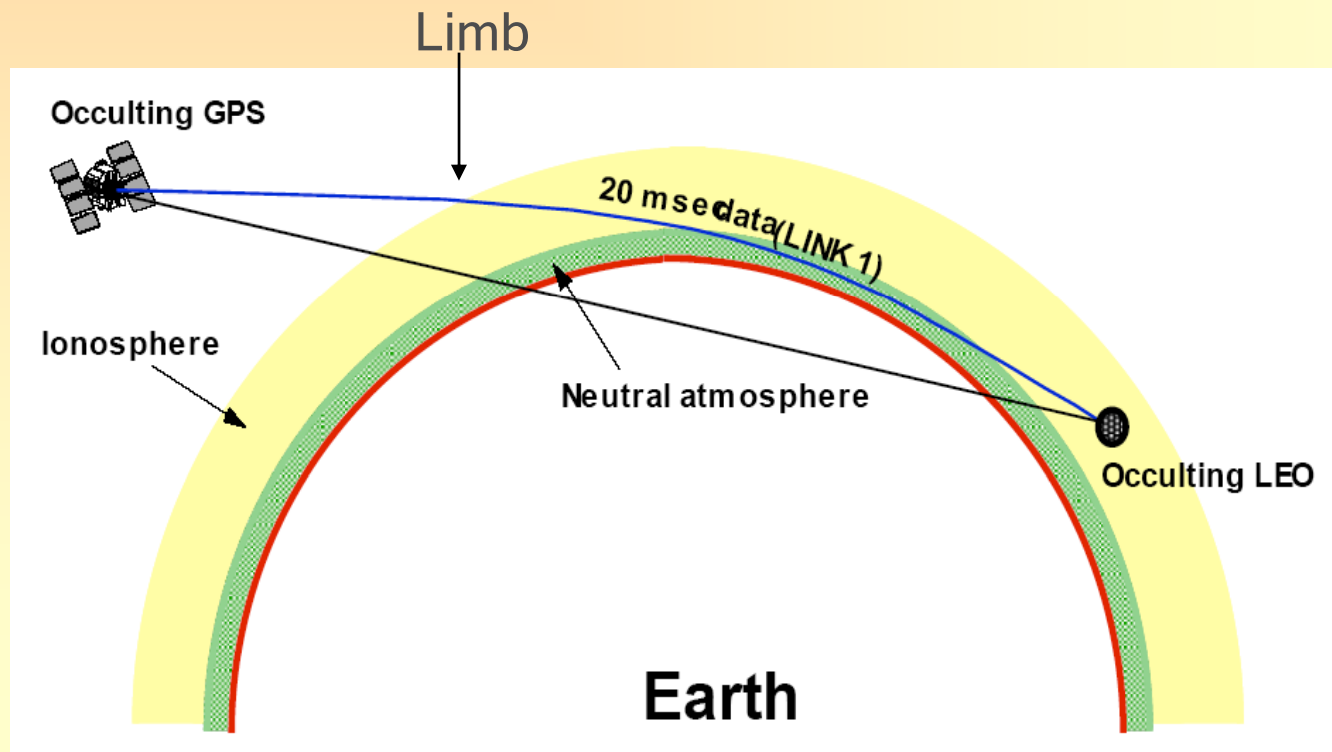
Three ways:

- *Passive technologies: sense radiation emitted by atmosphere, reflected by atmosphere*
- *Active technologies: emit radiation and measure how much scattered/reflected back*
- *GPS: measure phase delay of signals as it reflected in atmosphere*

GPS Occultation

Basic measurement principle:

Deduce atmospheric properties based on precise measurement of phase delay and amplitude.



Radio occultation for Climate

- ◆ *High Accuracy: Averaged profiles to $< 0.1K$*
- ◆ *Assured long-term stability*
- ◆ *Global 3D coverage: from low stratosphere to surface*
- ◆ *Vertical resolution: ~ 100 m in lower trop.*
- ◆ *Independent height and pressure/temp. data*
- ◆ *Compact, low-power, low-cost sensor*

Quantifying Variables

OBJETIVES:

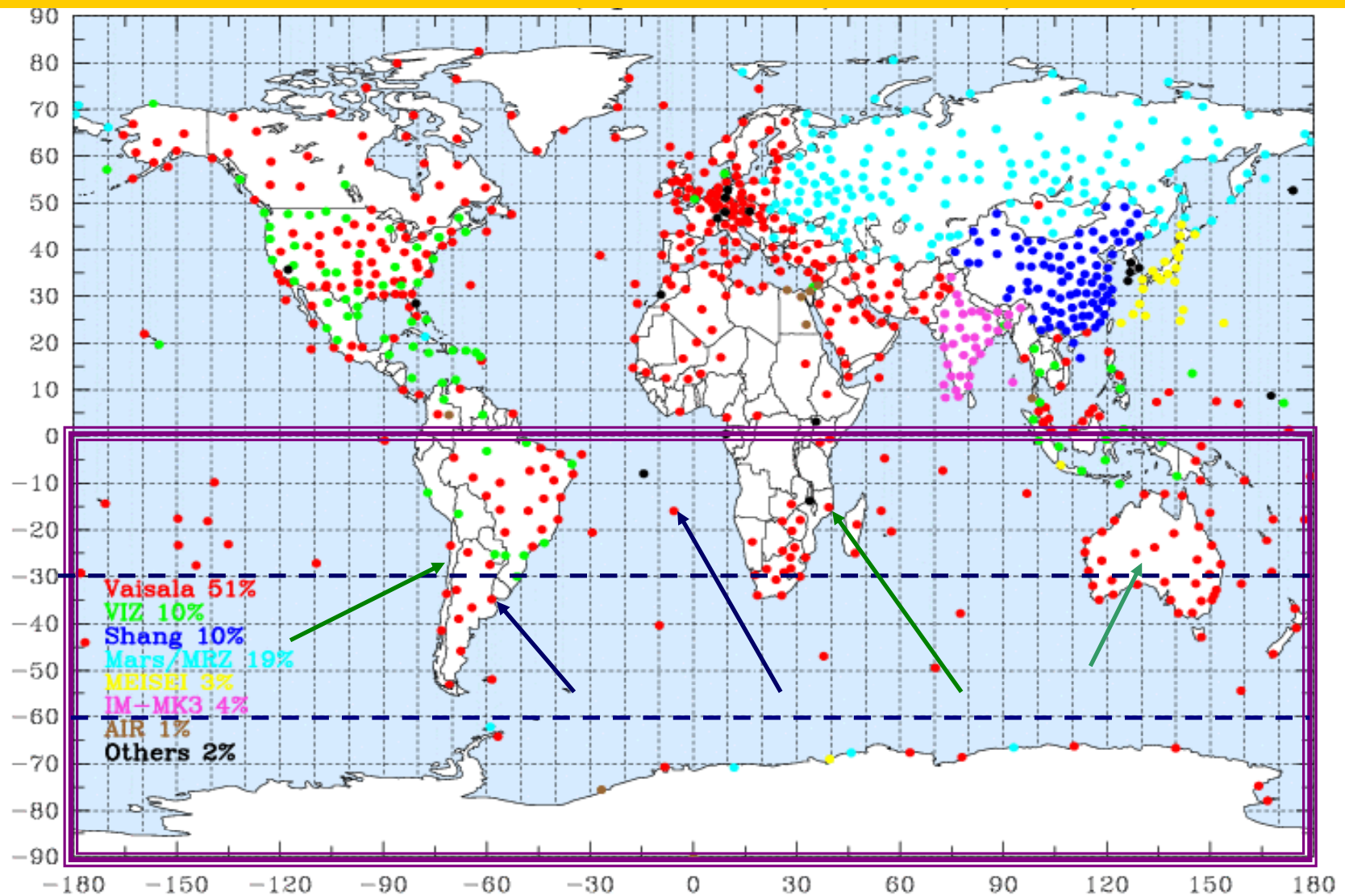
- ✦ *1. Characterize South Hemisphere in three bands of latitude : means values of T, HGHT, PWV, HR, SH for level of pressure*
- ✦

2. Radiosonde
ECMWF
GPS

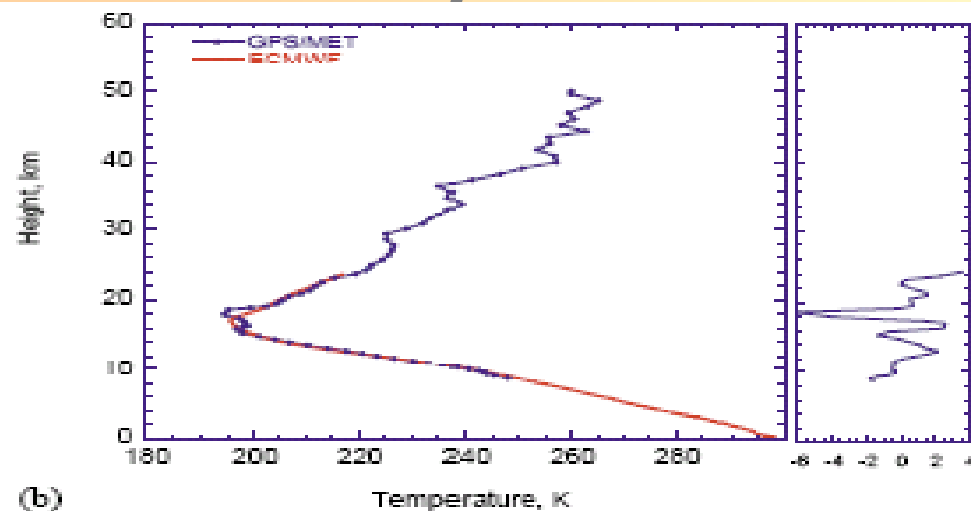
}

→ *Profiles involving T, P, RH, HGHT, PWV, Tropopause Levels and characteristics*
- ✦ *3. Comparision Results from 1 and 2*

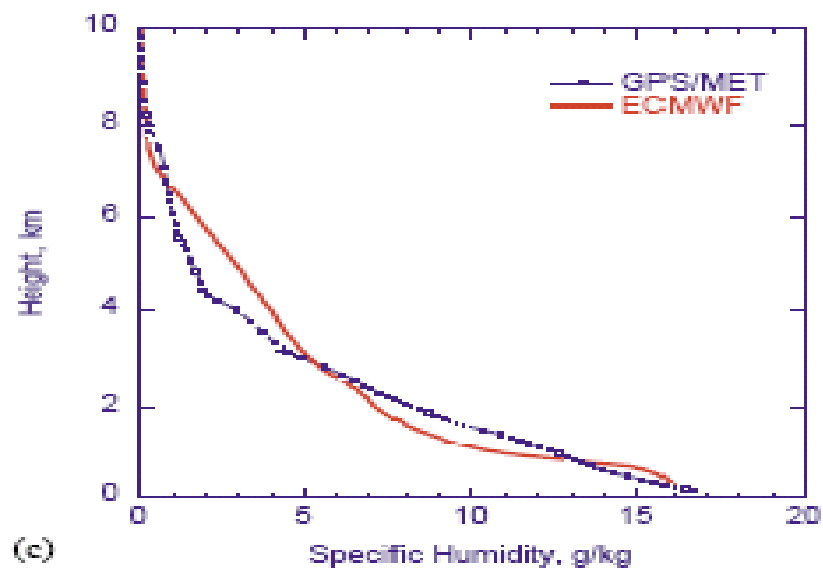
Radiosonde Stations



North Hemisphere Results



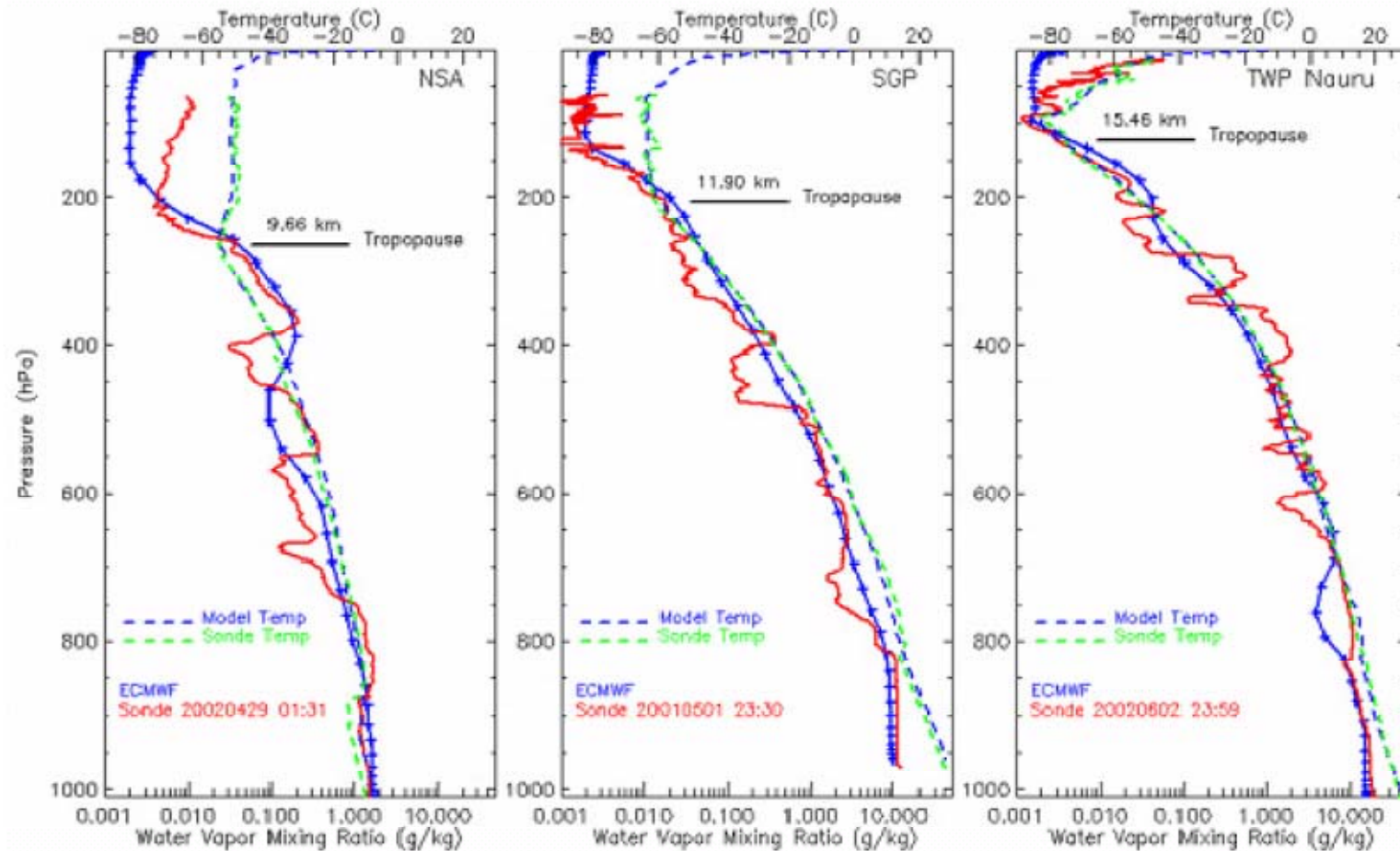
(b)



(c)

G.A. Hajj *, E.R. Kursinski, L.J. Romans, W.I. Bertiger, S.S. Leroy

North Hemisphere Results



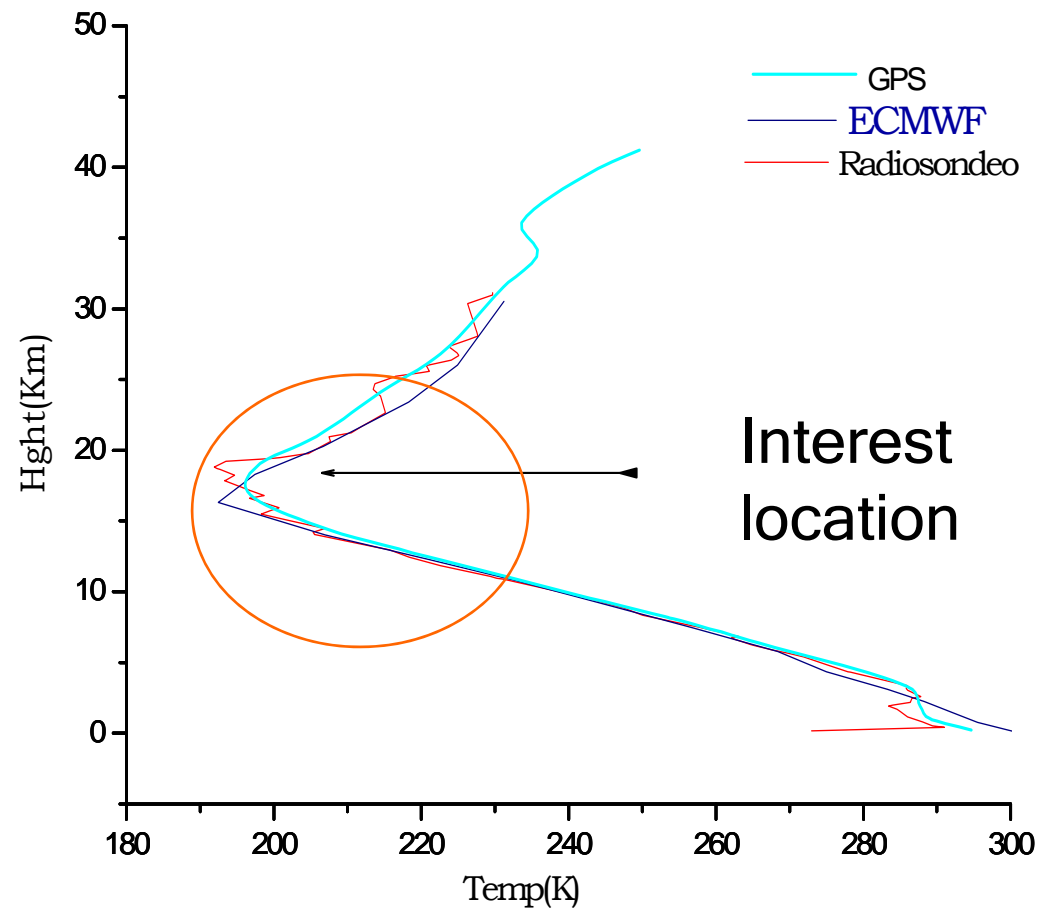
Preliminary Results

First band: 0°-30°S

Station 61901.

Santa Helena

2002-05-29 .12Z



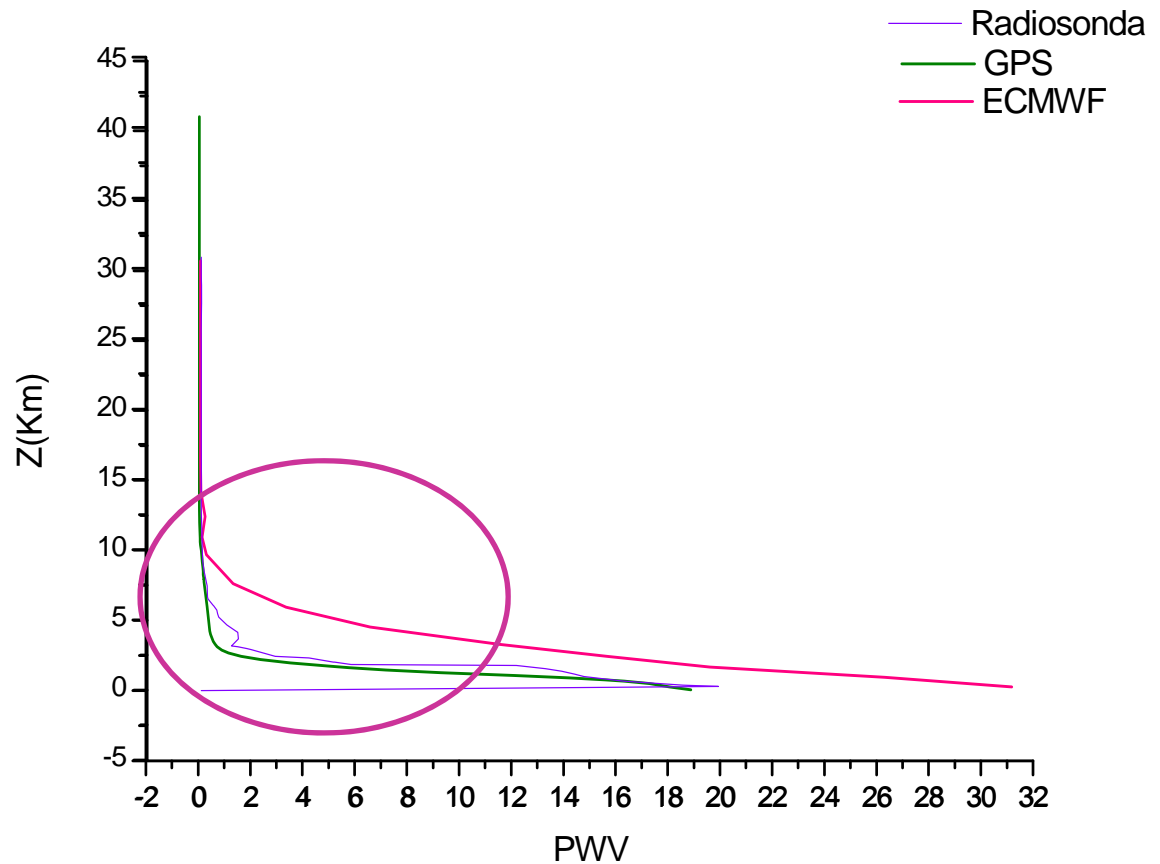
Preliminary Results

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Santa Helena

2002-05-29 .12Z



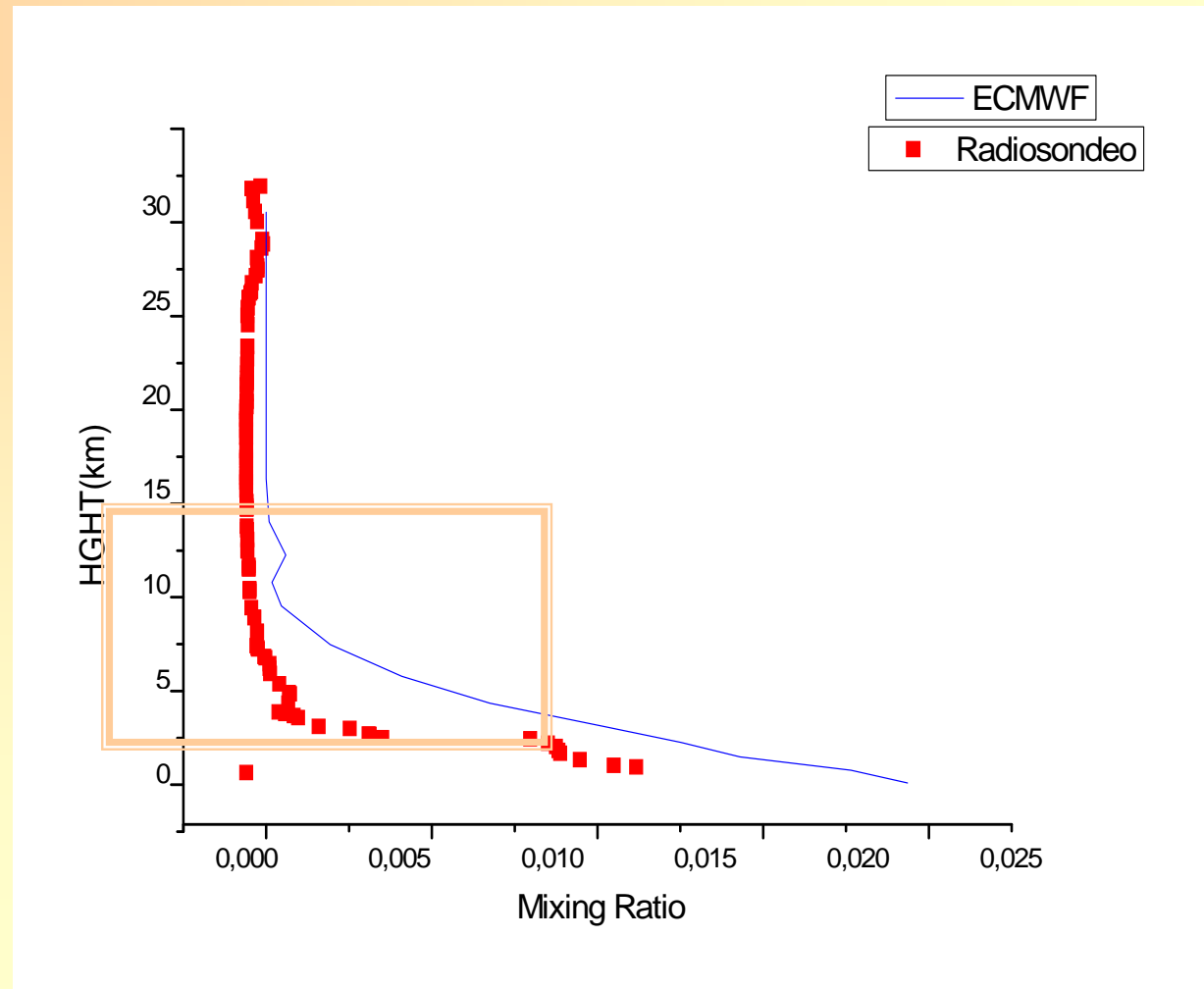
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2002-05-29 .12Z



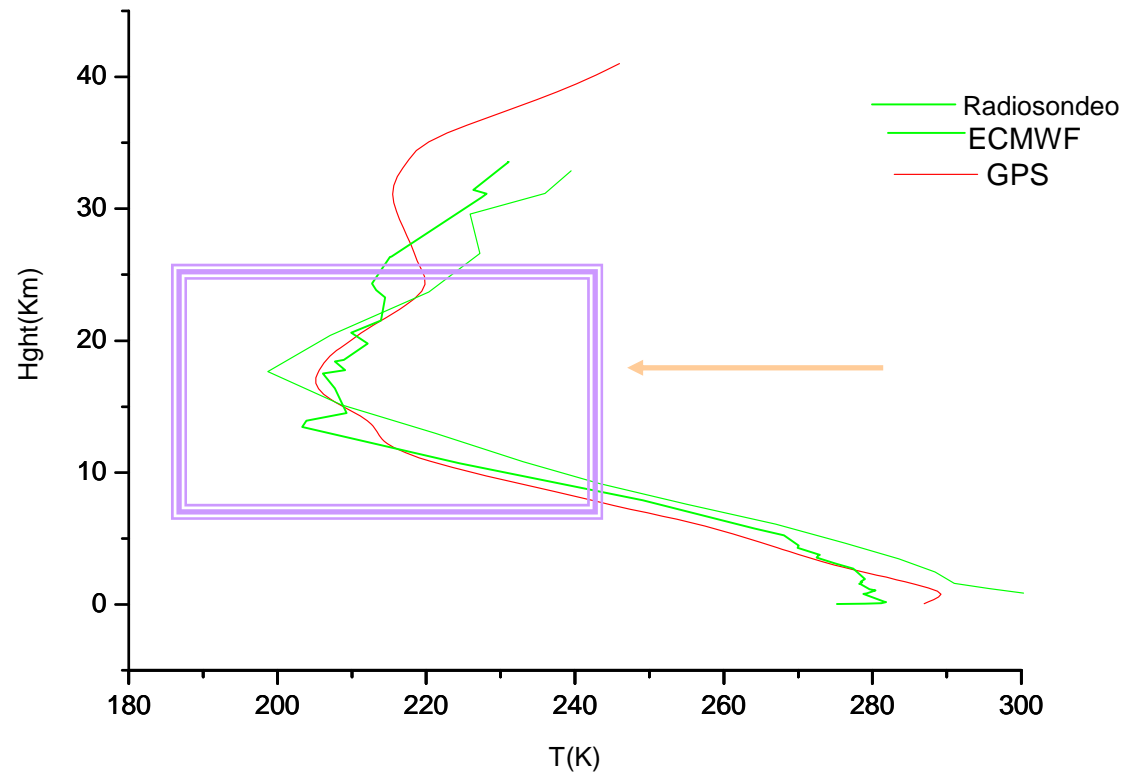
Preliminary Results

Second band: 30°-60°S

Station 87576

Ezeiza

2001-05-23 .12Z



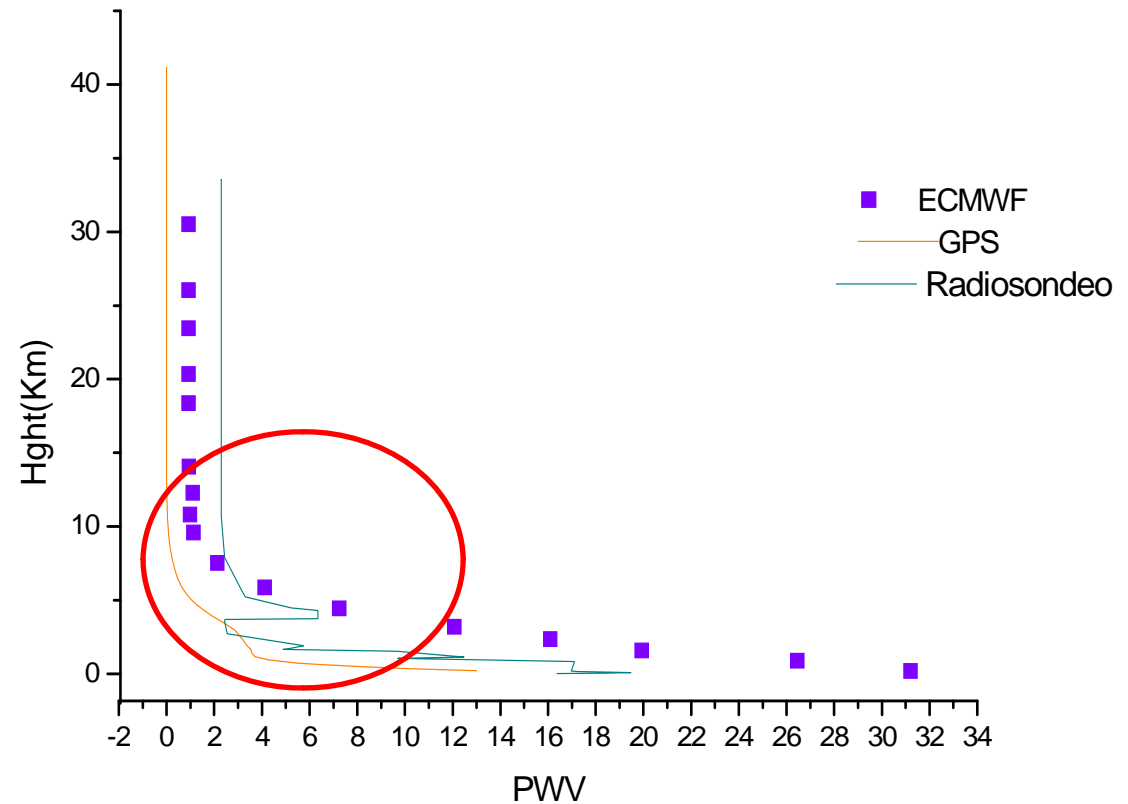
Preliminary Results

Second band: 30°-60°S

Station 87576

Ezeiza

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We're keeping working

THANK YOU