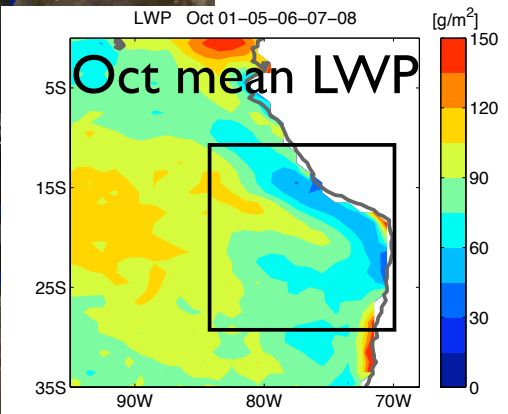
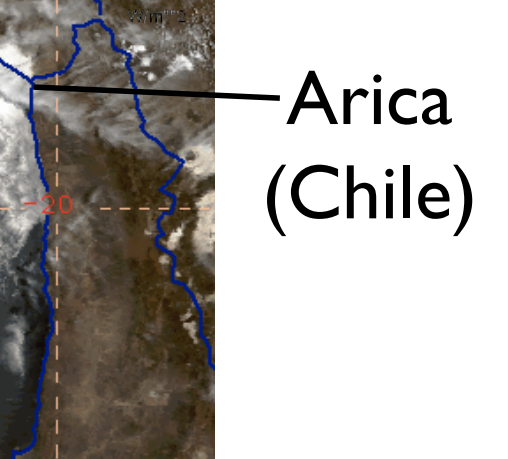
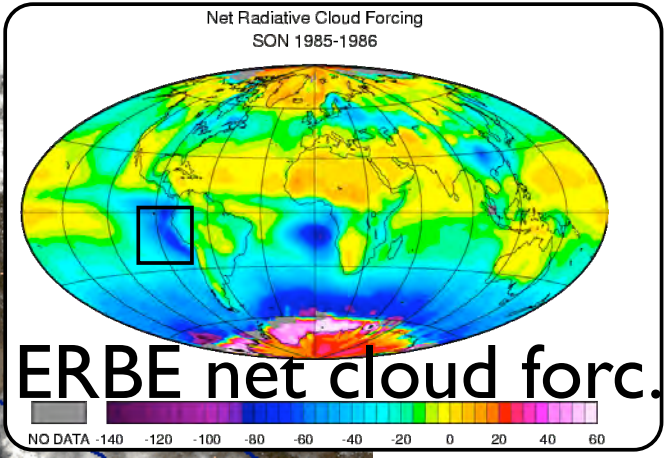
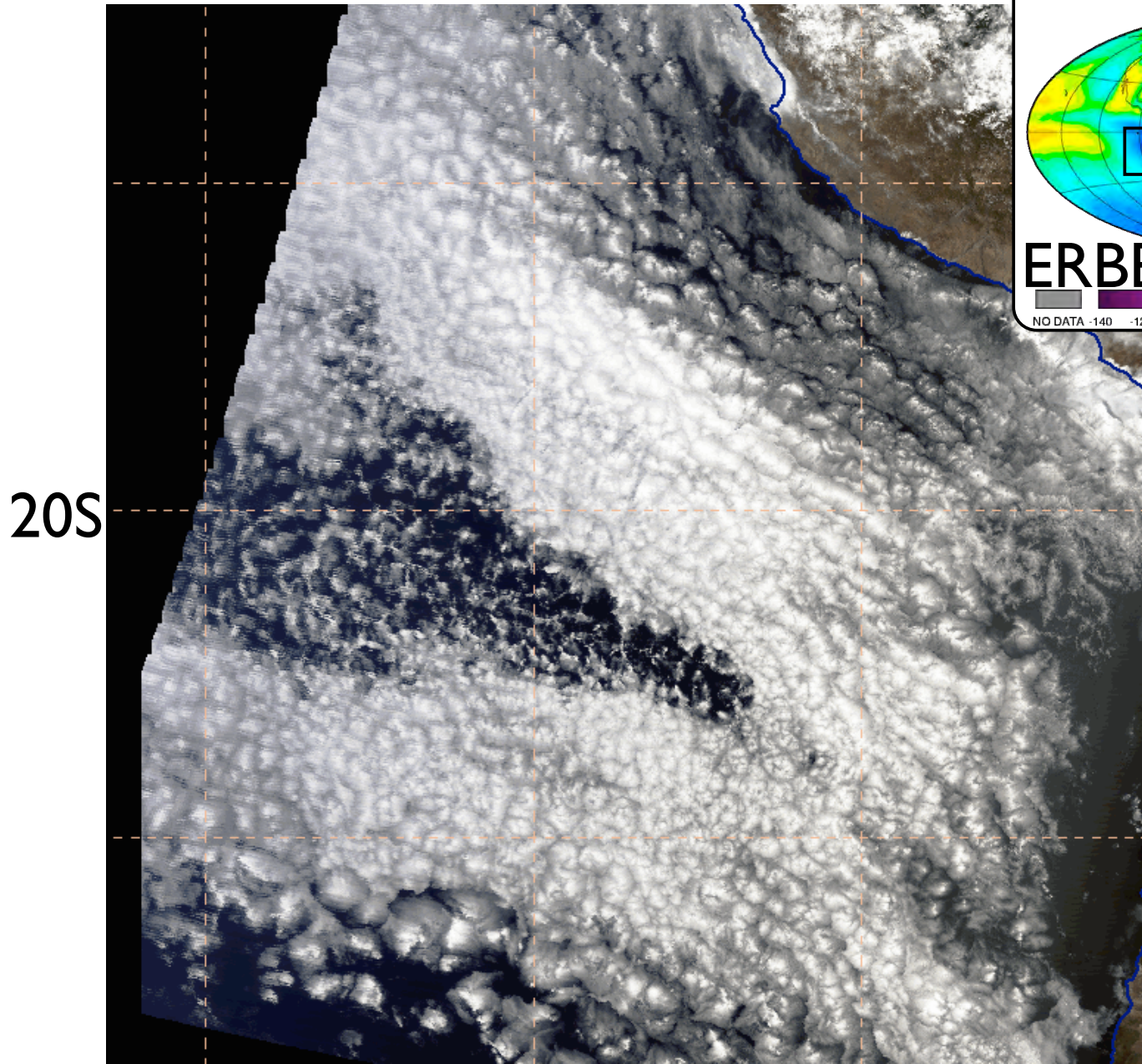


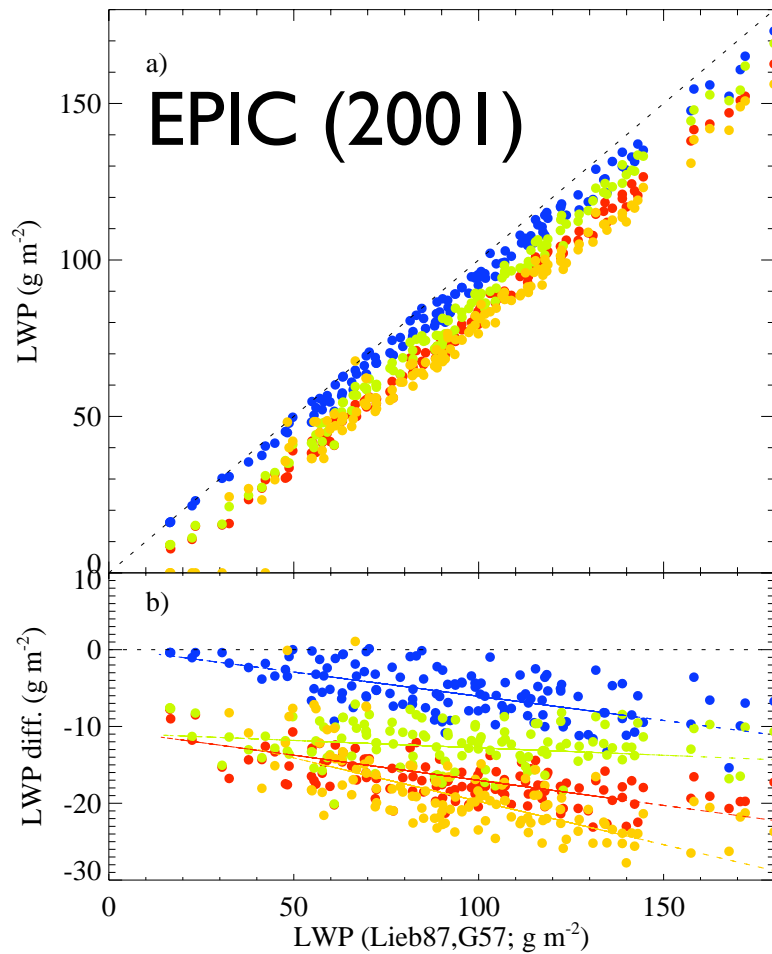
How dry are the Subtropics? or:
How did the ARM MPI83 end up in the Southeast Pacific?

Paquita Zuidema U of Miami
Maria Cadeddu Argonne NL





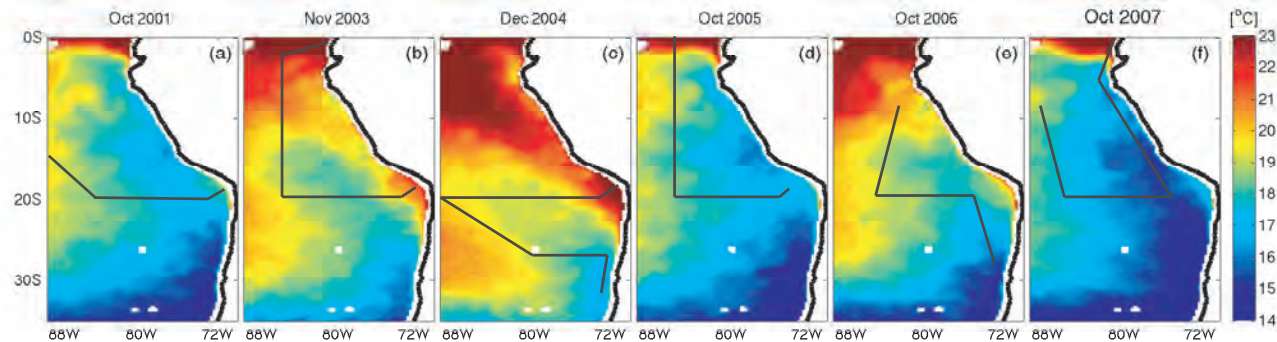
85W



more modern gaseous absorption models (Rosenkranz 1998, Liljegren 2005) produce lower LWPs than Liebe 1987

Zuidema et al. 2005

6 research cruises < 2008



(Prosensing) 183 GHz
GVR



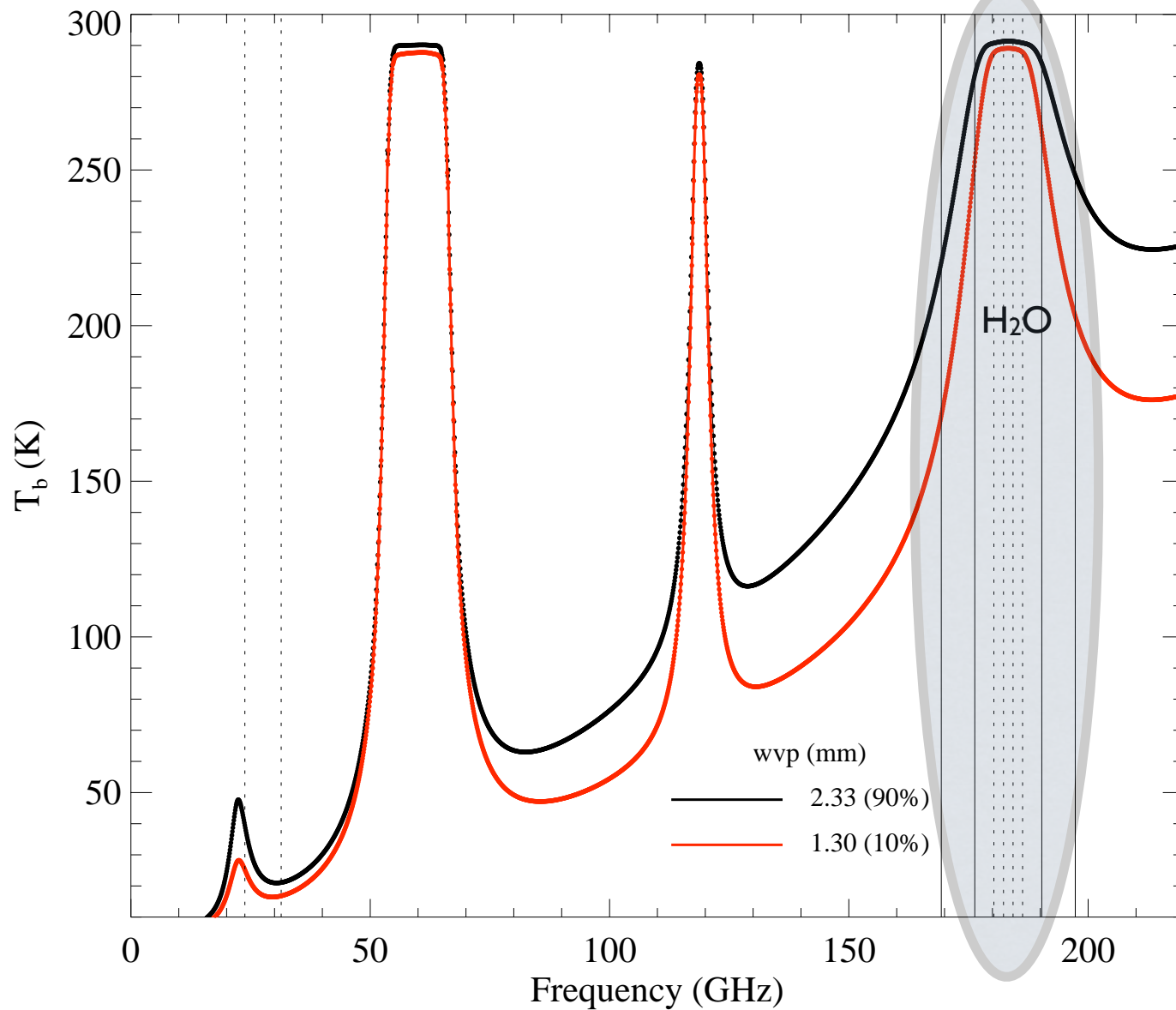
2-channel MWR (Peter
Minnett)

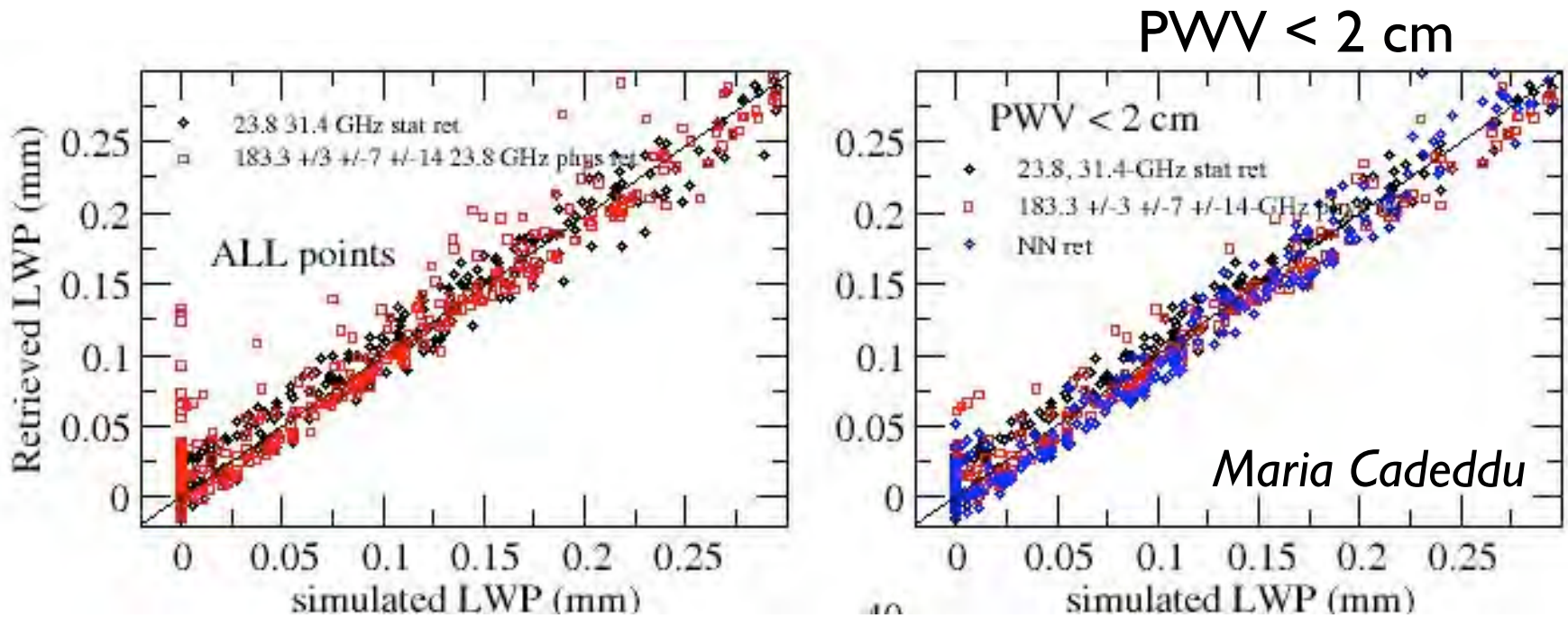
ARM Radiometrics 183

NOAA 90 GHz

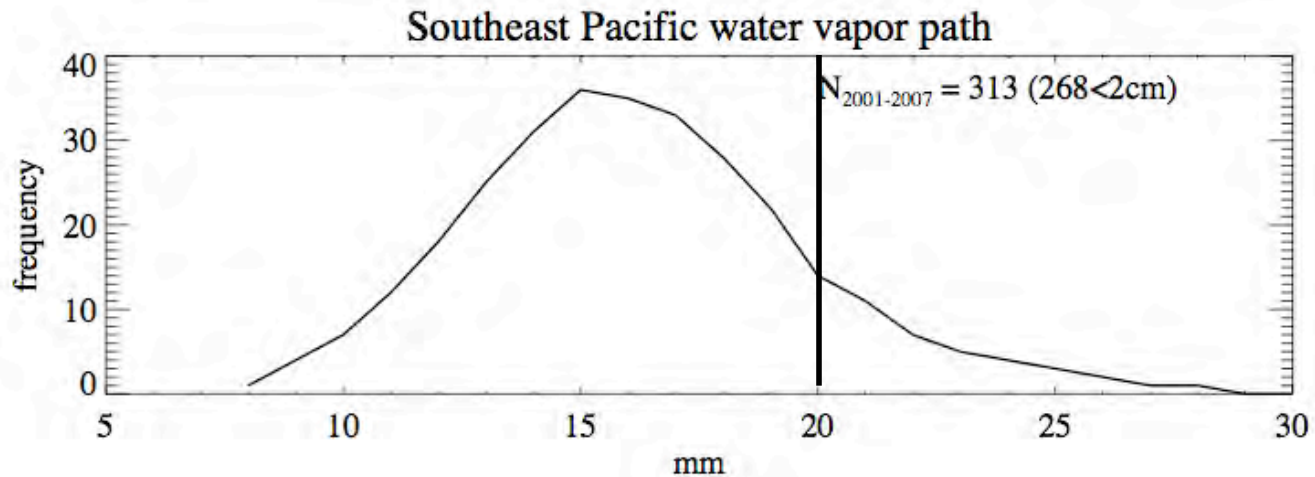


clear-sky spectra of 10th and 90th percentile VOCALS-REx domain soundings





calculations based on EPIC, PACS03 soundings suggest:
 10 g m⁻² clear-sky error, 4 g m⁻² bias - but include f= 23.8 GHz

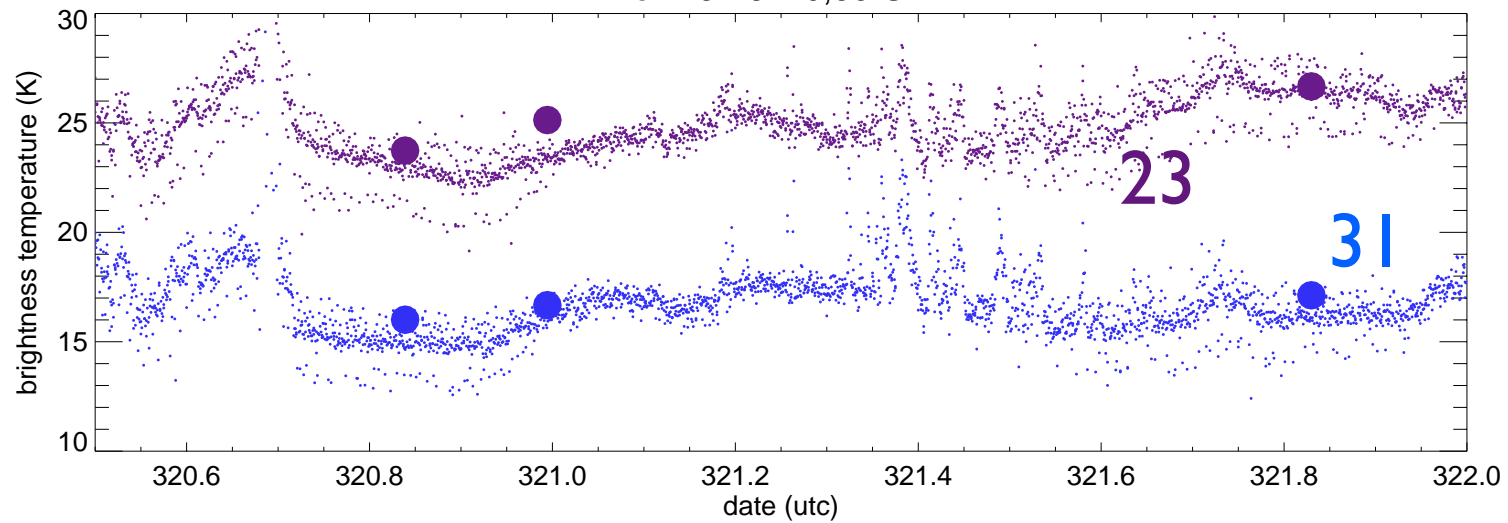


initial looks....

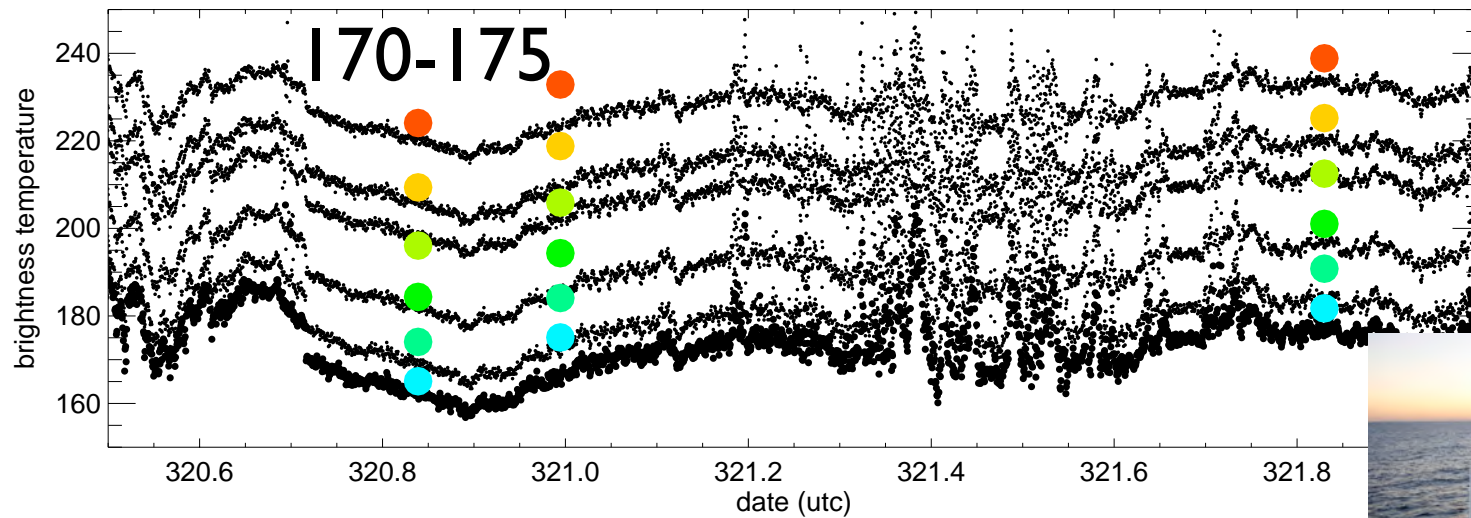


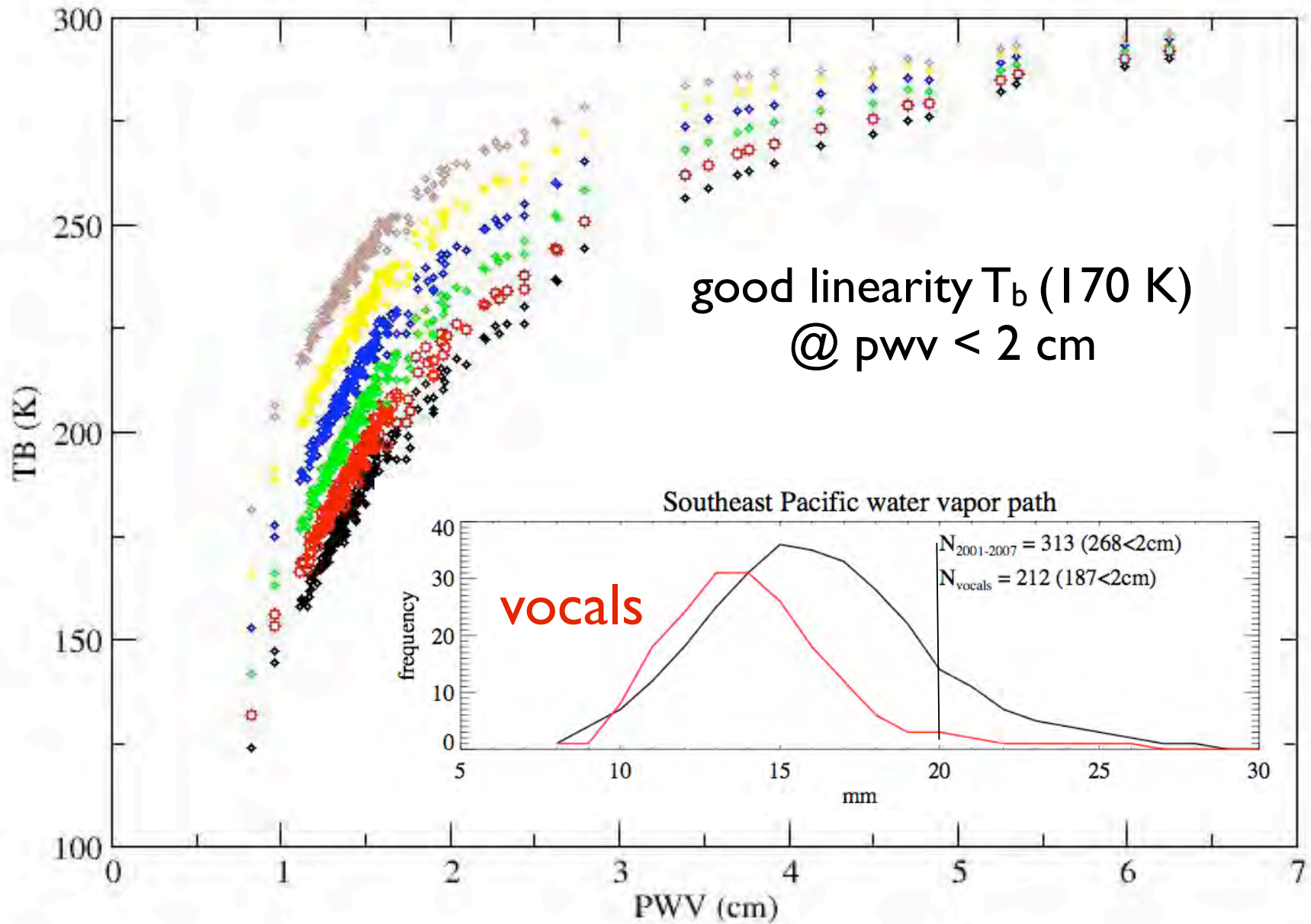
good MWR/sonde clear-sky brightness temperature comparison !!

nov 15-16: 20,30 GHz



nov 15-16: 170-175 GHz





double-peaked LWP diurnal cycle

Diurnal Cycle at 75W, 20S: Nov. 12-15

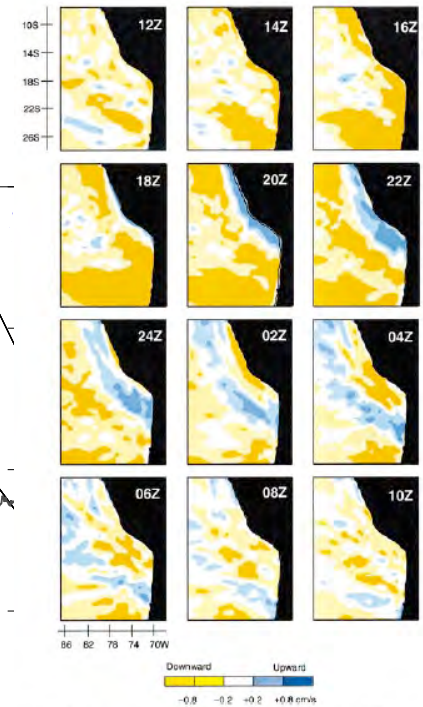
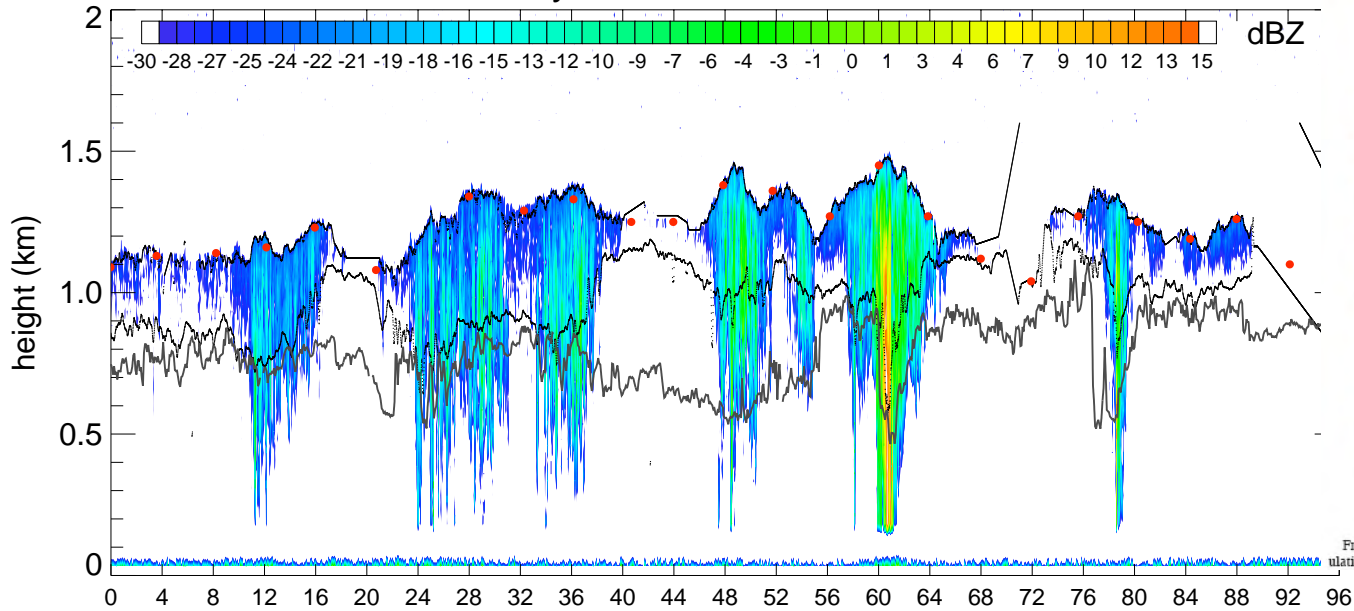
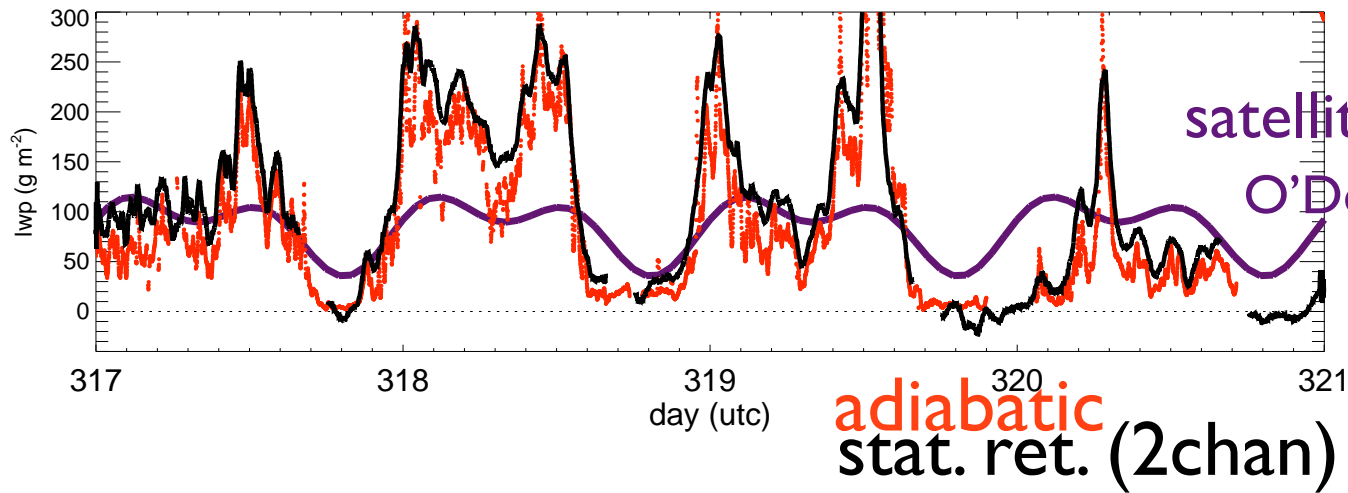


Fig. 5. Mean vertical velocity at 800 hPa for the Nov 2001 simulation, shown every 2 h using a common shading scale (at bottom).

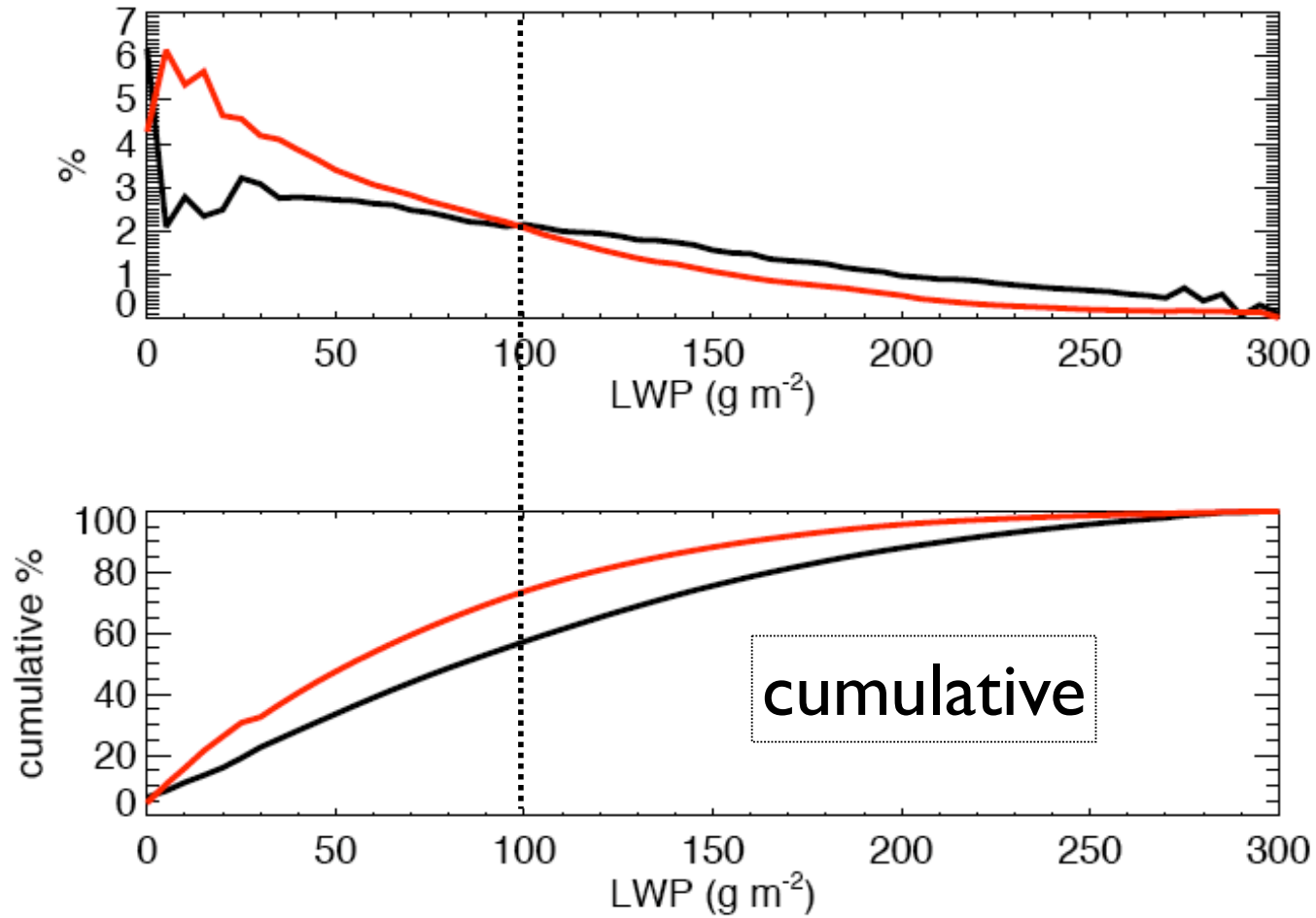


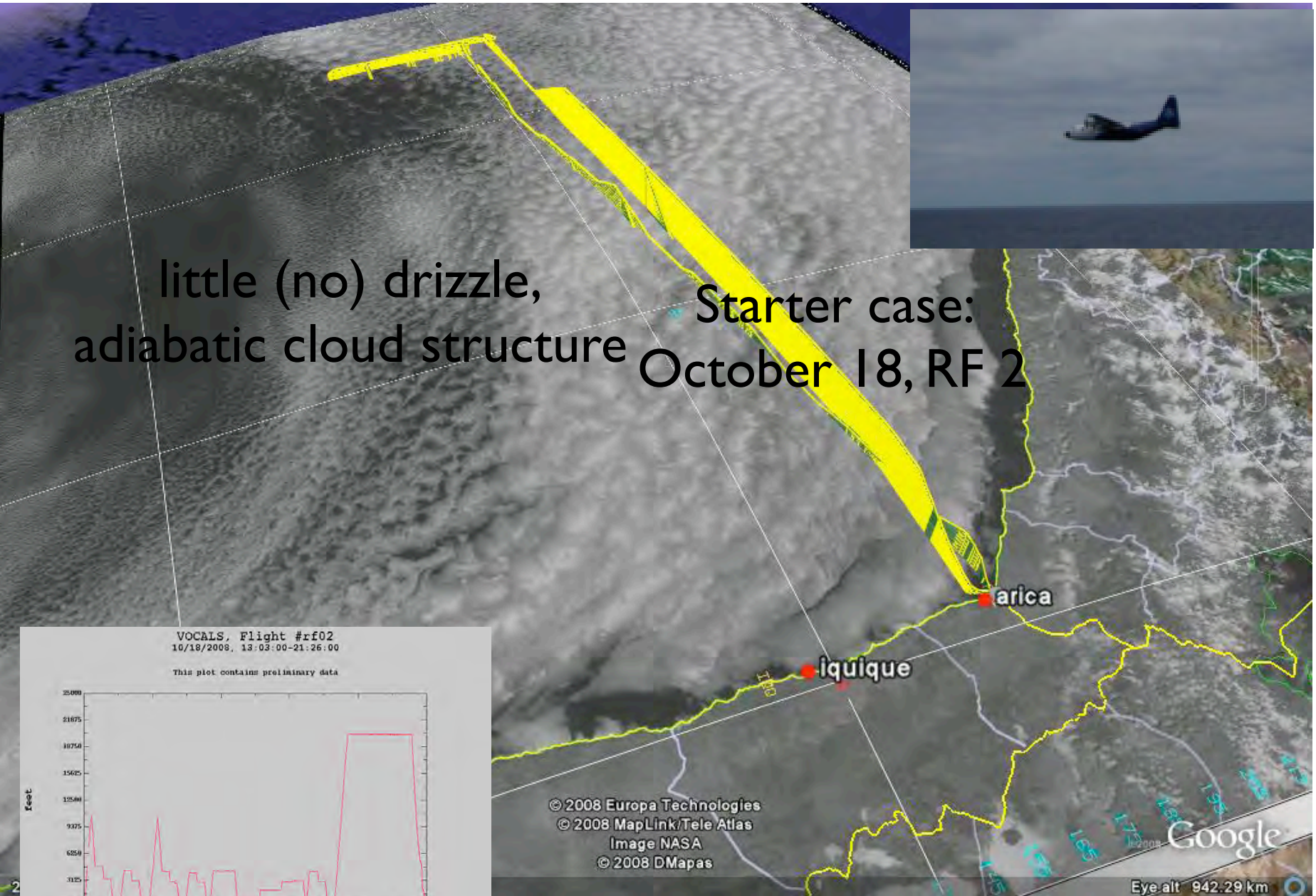
satellite microwave

O'Dell et al. 2008

adiabatic
stat. ret. (2chan)

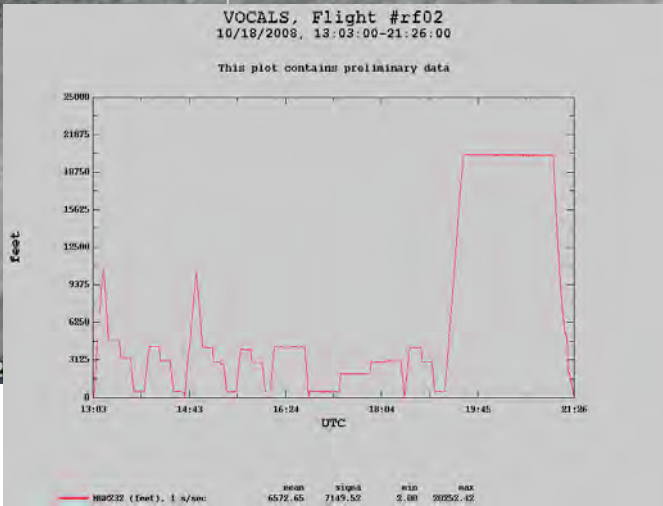
VOCALS LWP < EPIC, 2003 cruise values





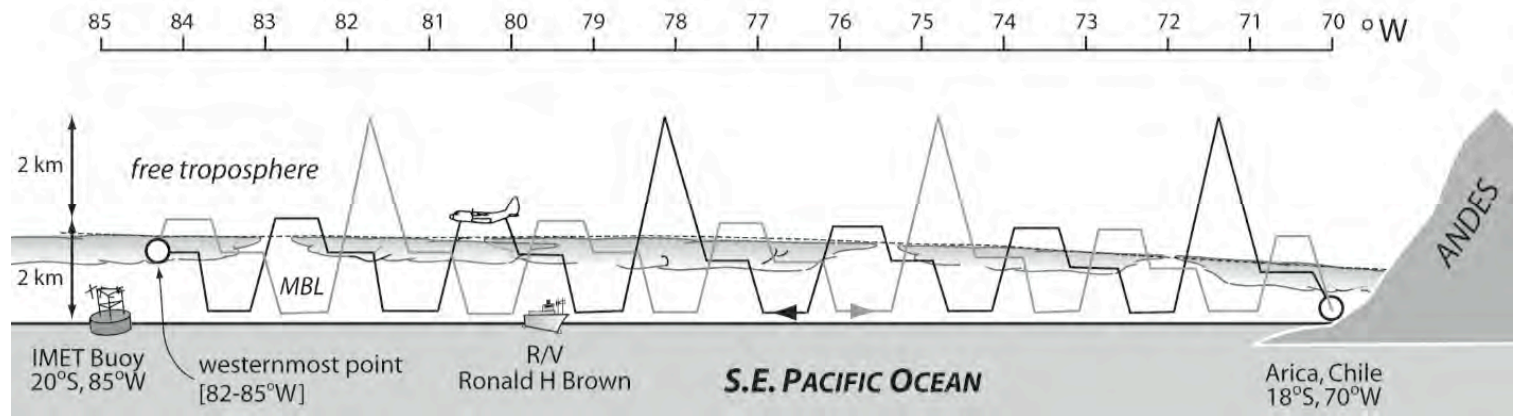
little (no) drizzle,
 adiabatic cloud structure

Starter case:
 October 18, RF 2



© 2008 Europa Technologies
 © 2008 MapLink/Tele Atlas
 Image NASA
 © 2008 DMapas

Google
 Eye alt 942.29 km



T_b from REx-domain soundings, initial guess

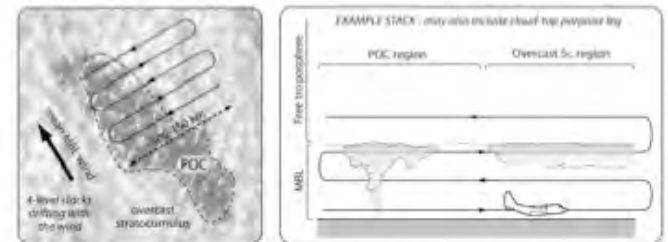
calibrated T_b → (clear-sky) above-cloud T_b → $PWV_{\text{above-cloud}} = f(T_b)$

+

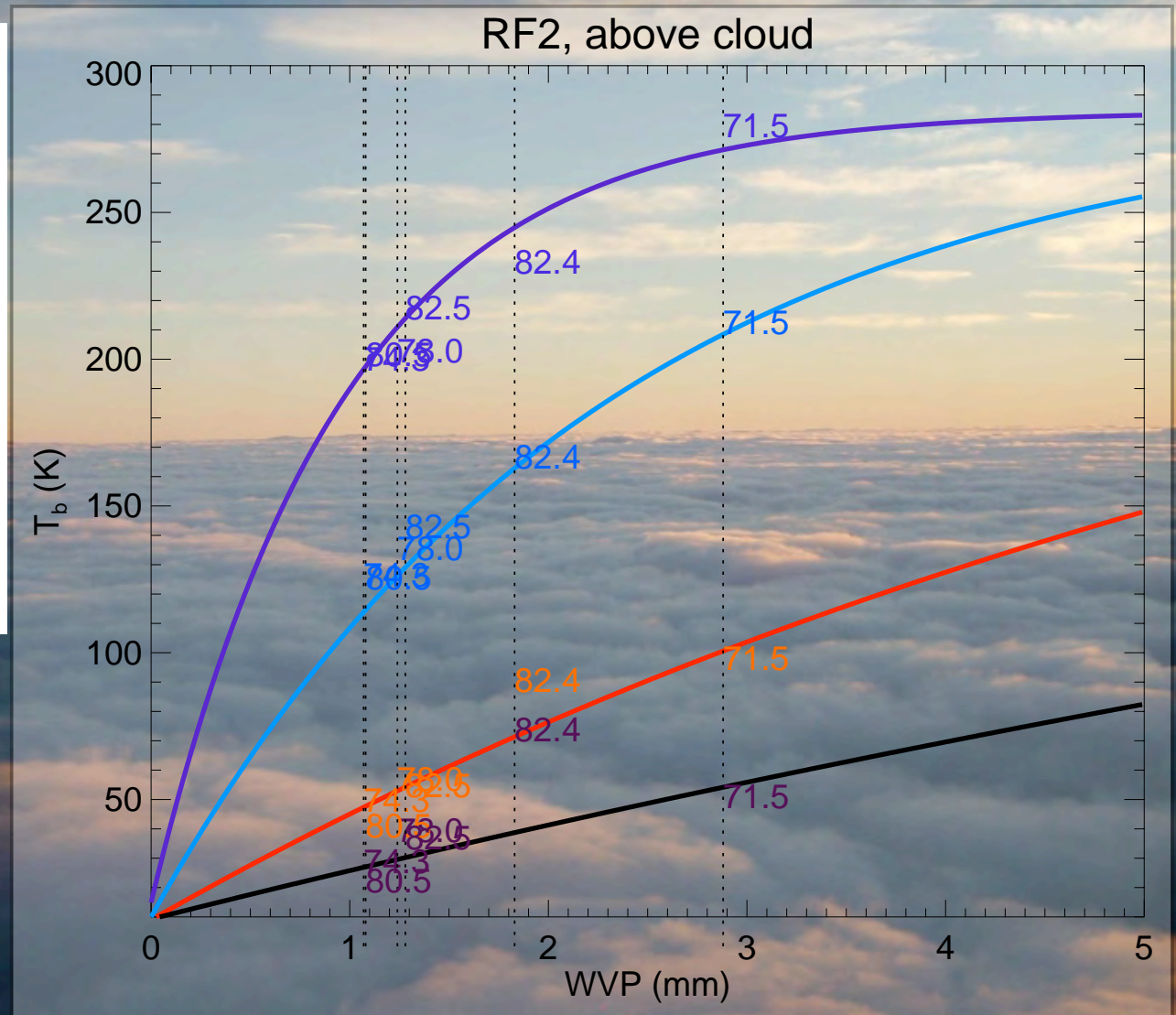
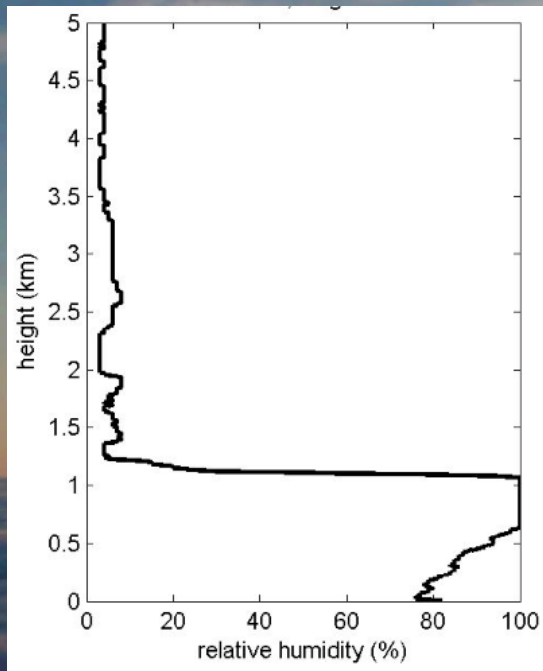
aircraft-derived WVP

initial-guess LWP to sub-cloud T_b using WVP estimate

underdetermined => optimal estimation



RF2 above-cloud WVPs 1-3 mm (!)



how may the VOCALS microwave radiometer experience benefit ARM?

- relevant to ship/marine platform (AMF2)

- experience w/ 90, 183 GHz f

similarity to AMF Azores/Pt. Reyes deployment

Thanks !

Questions?

pzuidema@miami.edu

