

TRUTH:

TRansport and Processes controlling Upper Tropospheric Humidity

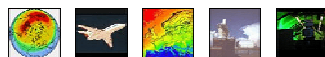
Proposal for a HALO mission

Andreas Fix, Gerhard Ehret, Martin Wirth, Christoph Kiemle, Harald Flentje

DLR, Institut für Physik der Atmosphäre

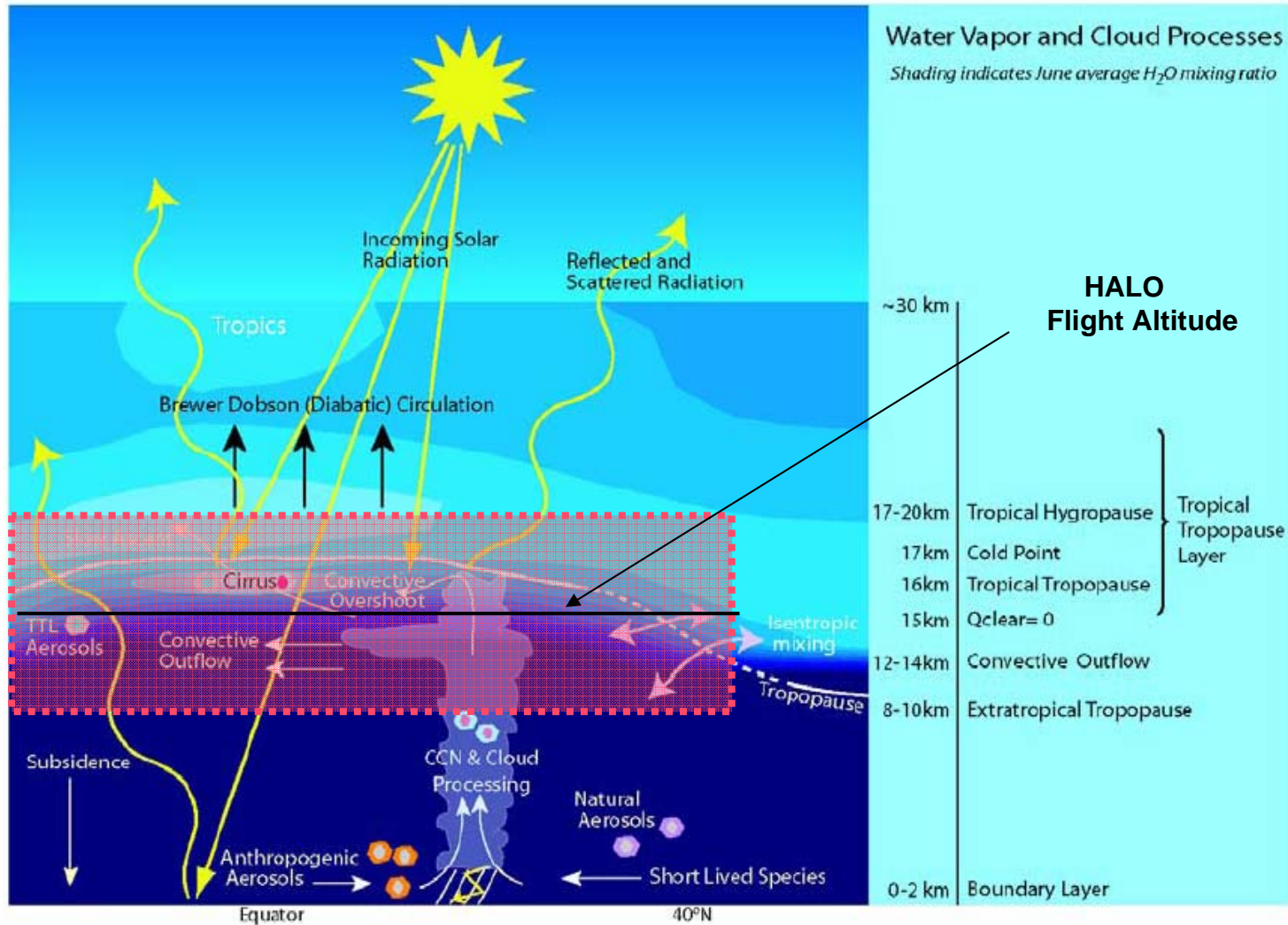


Institut für
Physik der Atmosphäre



TRUTH:

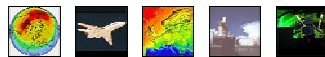
TRansport and Processes controlling Upper Tropospheric Humidity



source: IGAC



Institut für
Physik der Atmosphäre



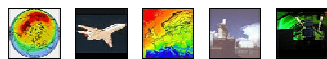
Main Scientific Goals

- Understand the mechanisms and the extent of dehydration of the tropical and subtropical upper troposphere
- Quantify the relative importance of non-convective versus convective activity in controlling dehydration
- Deliver a consistent picture of the processes that control UTH in the subtropics including the general circulation patterns
- Determine the regional and temporal preferences for the dehydration processes and coupling to seasonal or annual cycles
- Identify linkages to cloud-scale microphysics
- Help to validate satellite instruments and global circulation models



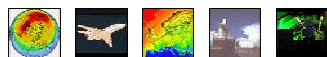
DLR

Institut für
Physik der Atmosphäre

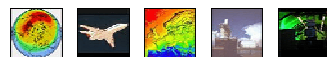
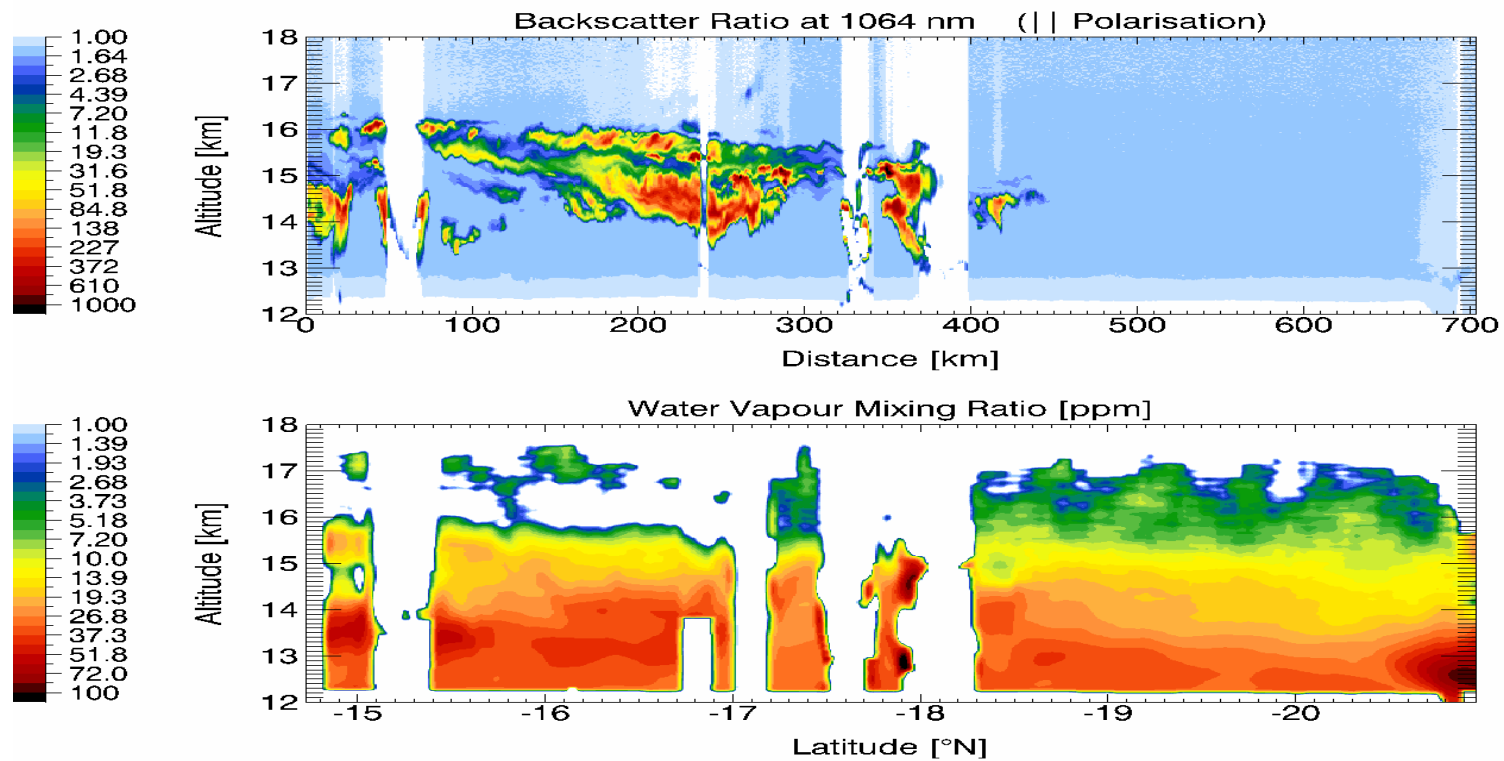


Potential Instruments

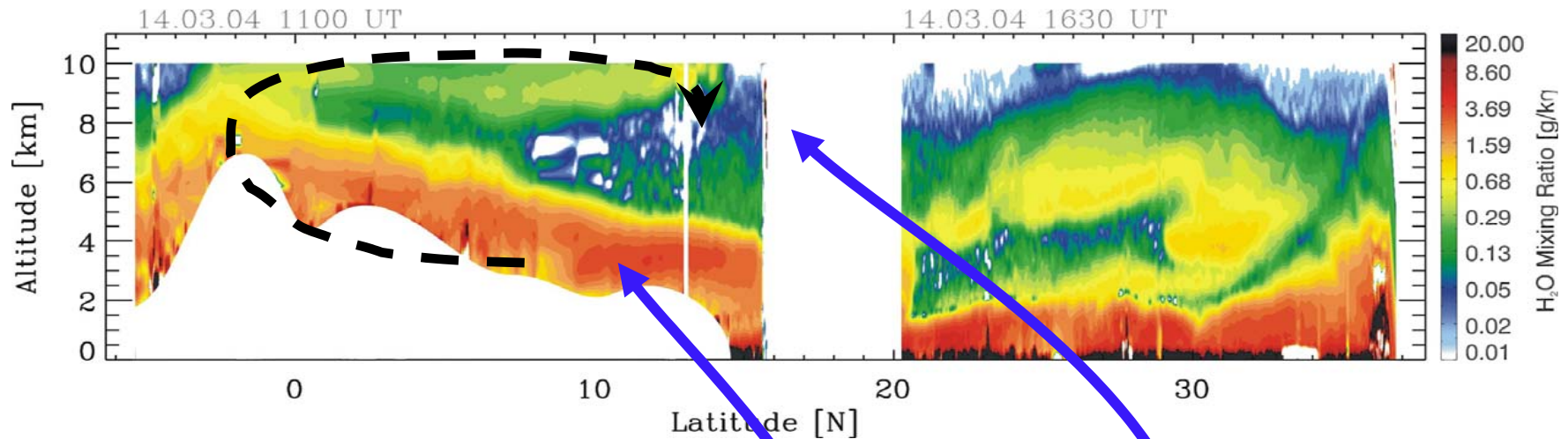
	Instrument	Measurement Parameters
Remote Sensing	H ₂ O Differential Absorption Lidar	2-dim UTH, cloud properties, aerosol
	O ₃ Differential Absorption Lidar	2-dim O ₃ , cloud properties, aerosol
	Temperature Profiler	Temperature profiles
In-situ	Hygrometer (Ly- α , TDL, dewpoint, SAW or similar)	In-situ H ₂ O
	In-situ ozone instrument	In-situ O ₃
	Tunable diode laser (TDL) Alternative: Air Sampler	δD , $\delta^{18}O$
	Scattering Probes, Particle Imager	In-situ properties of ice crystals
	Dropsondes	Temperature, Wind, H ₂ O
Radiation	Pyranometer, Pyrgeometer	Outgoing longwave and solar radiation
	Radiometer	Surface Temperature



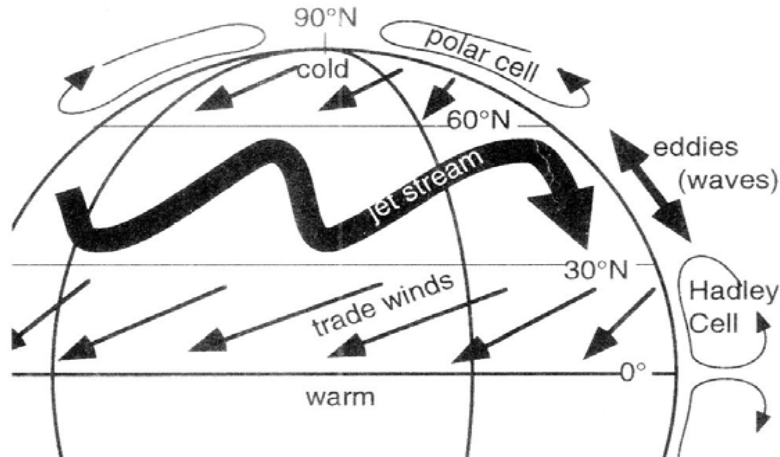
DIAL Measurements of H₂O and Cirrus during Troccinox 2004



H2O Measurements over the Tropical Atlantic



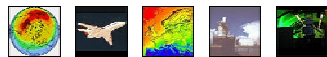
Hadley-Walker Circulation



"Dry Pool"



Institut für
Physik der Atmosphäre



Target Areas ?

