A New Microbase Product:

Adding phase classification, AERI, and multisensor retrievals

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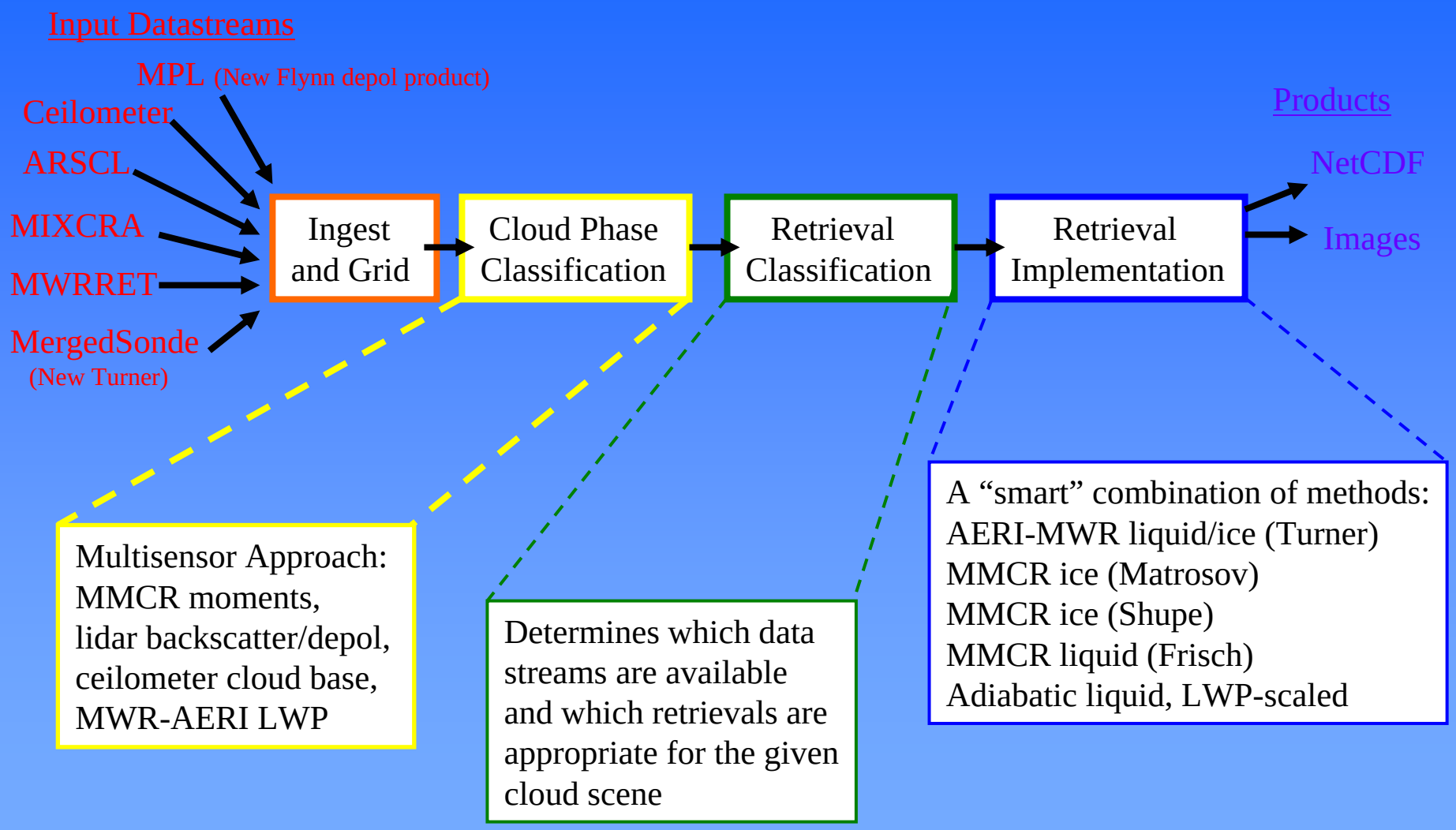
The General Idea



Datastreams

•**ARSCL –** MMCR profiles of reflectivity, mean Doppler velocity, spectral width

•**Ceilometer –** Cloud base height

•**MergedSounding –** Thermodynamic profiles (New Turner version)

•**MWRRET –** LWP retrieval

•**MIXCRA –** AERI- and MWR-based retrievals of Re, LWP, and some layer-average ice properties

•**MPL –** Backscatter and depolarization ratio

Cloud Classification

- Multisensor approach currently used: MMCR, MPL, MWR, ceilometer, soundings
- Can incorporate other classifiers (MMCR spectral)
- Difficult without a solid lidar depolarization ratio and calibrated backscatter product
- Fixed threshold approach with many conditional constraints
- Conditionals used to determine retrieval type

Example classification criteria:

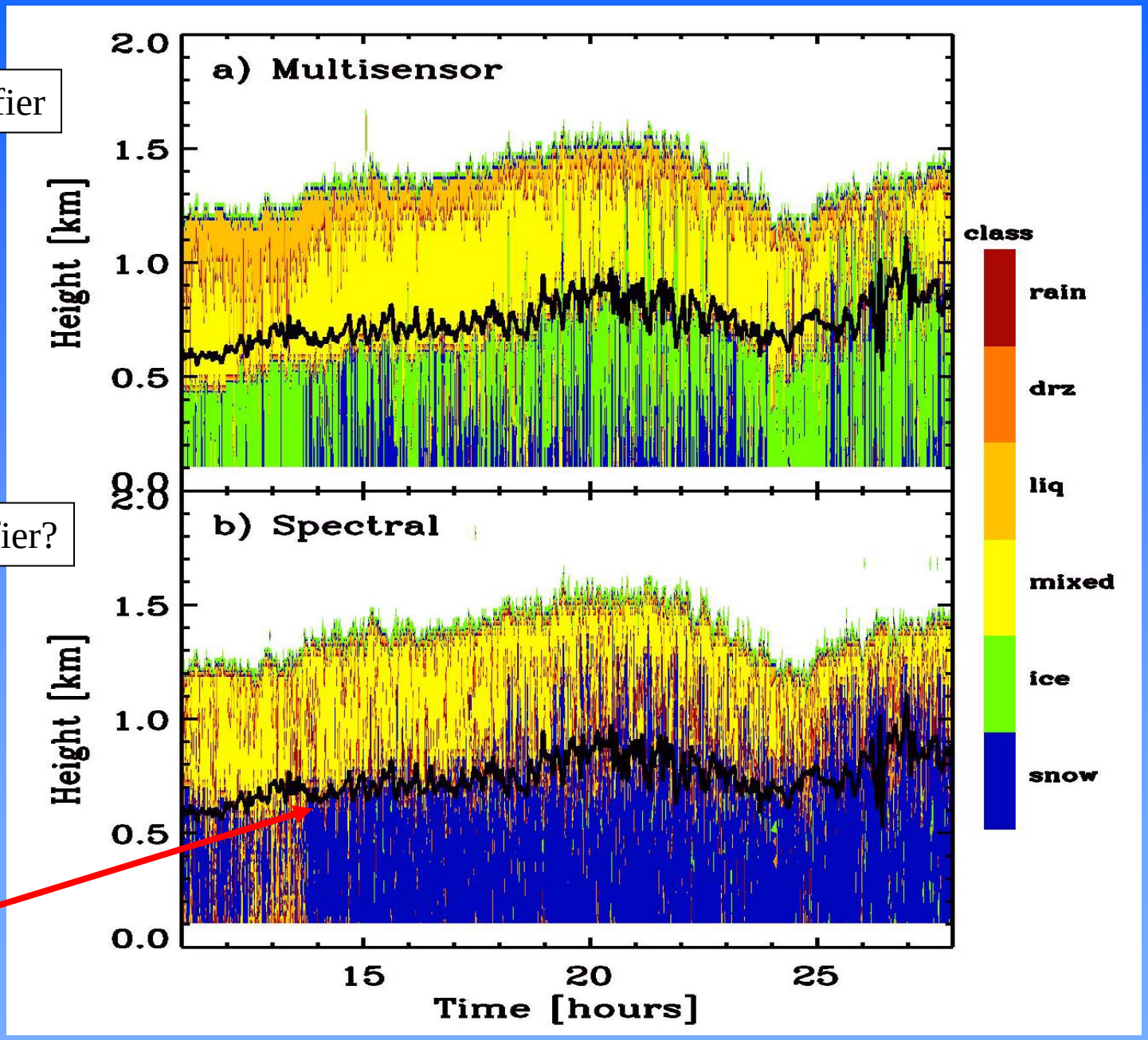
- Must be a liquid-containing cloud if there is a non-zero LWP
- No ice hydrometeors at T > 0C, no liquid hydrometeors at T < -40C
- Liquid present if low depol ratio and high backscatter (relative!)
- No liquid-only for reflectivity > -15 dBZ

Cloud Classification

Current classifier

Future classifier?

Remarkable identification of cloud base



Retrievals – Liquid

	Liquid-only	Liquid and/or Mixed-phase	Precip. and/or no LWP
AERI, MIXCRA avail.	LWC: Frisch et al. 1995 (LWP-scaled) Re: MIXCRA	LWC: Adiabatic* (LWP-scaled) Re: MIXCRA	LWC: Adiabatic* (unscaled) Re: Climatology
No AERI, MIXCRA	LWC and Re: Frisch et al. 1995 (LWP-scaled)	LWC: Adiabatic* (LWP-scaled) Re: Climatology	

* If adiabatic calculation does not work due to the specific thermodynamic profile a reflectivity power law relationship is used.

Retrievals - Ice

	Ice-only (LWP = 0)	Ice and/or mixed (LWP > 0)	No LWP estimate
AERI, MIXCRA avail.	IWC: Matrosov 1999 (tau-scaled) Re: MIXCRA	IWC and Re: Matrosov 1999 (tau-scaled)	IWC and Re: Reflectivity empirical (clim. coefficients)
No AERI, MIXCRA	IWC and Re: Reflectivity empirical (clim. coefficients)	IWC and Re: Reflectivity empirical (clim. coefficients)	

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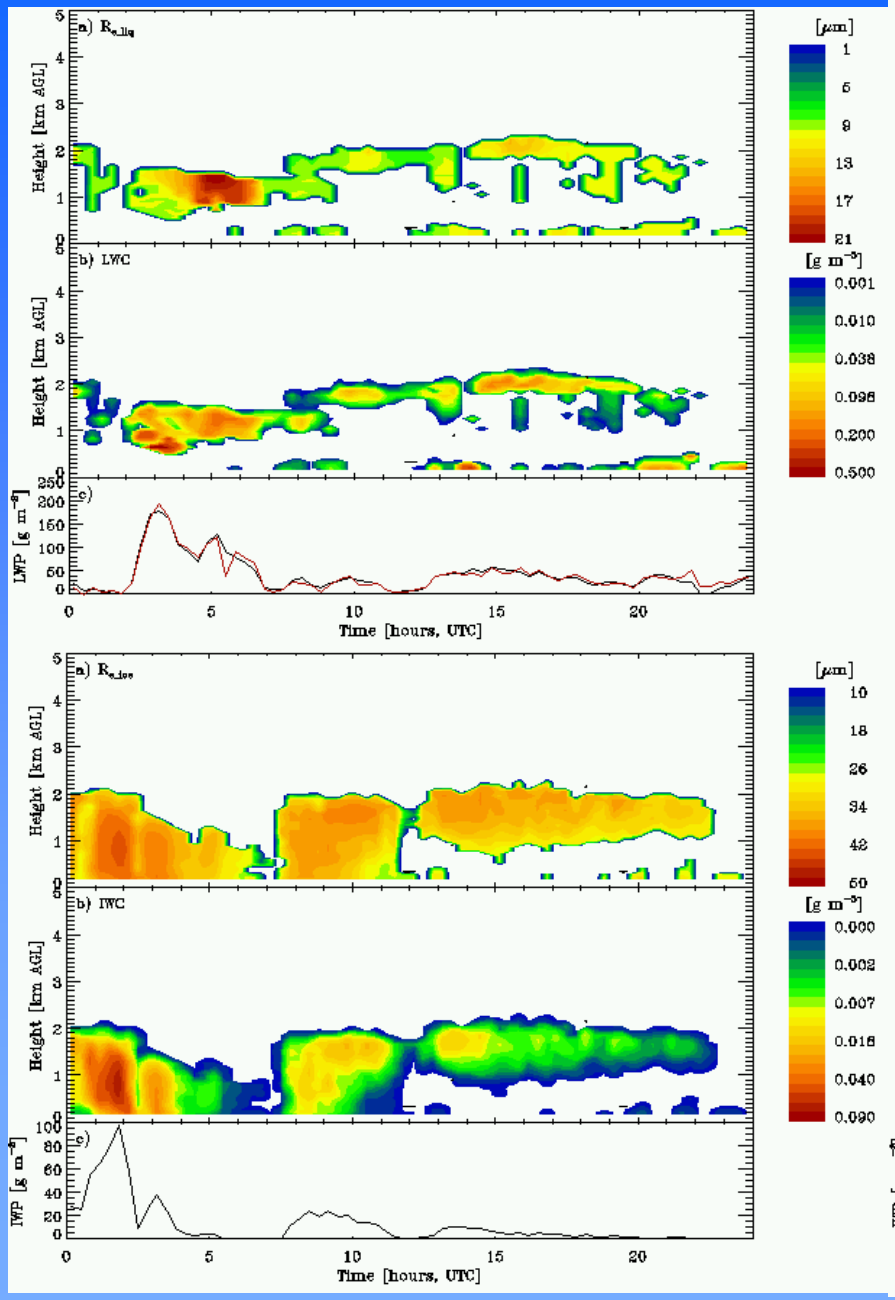
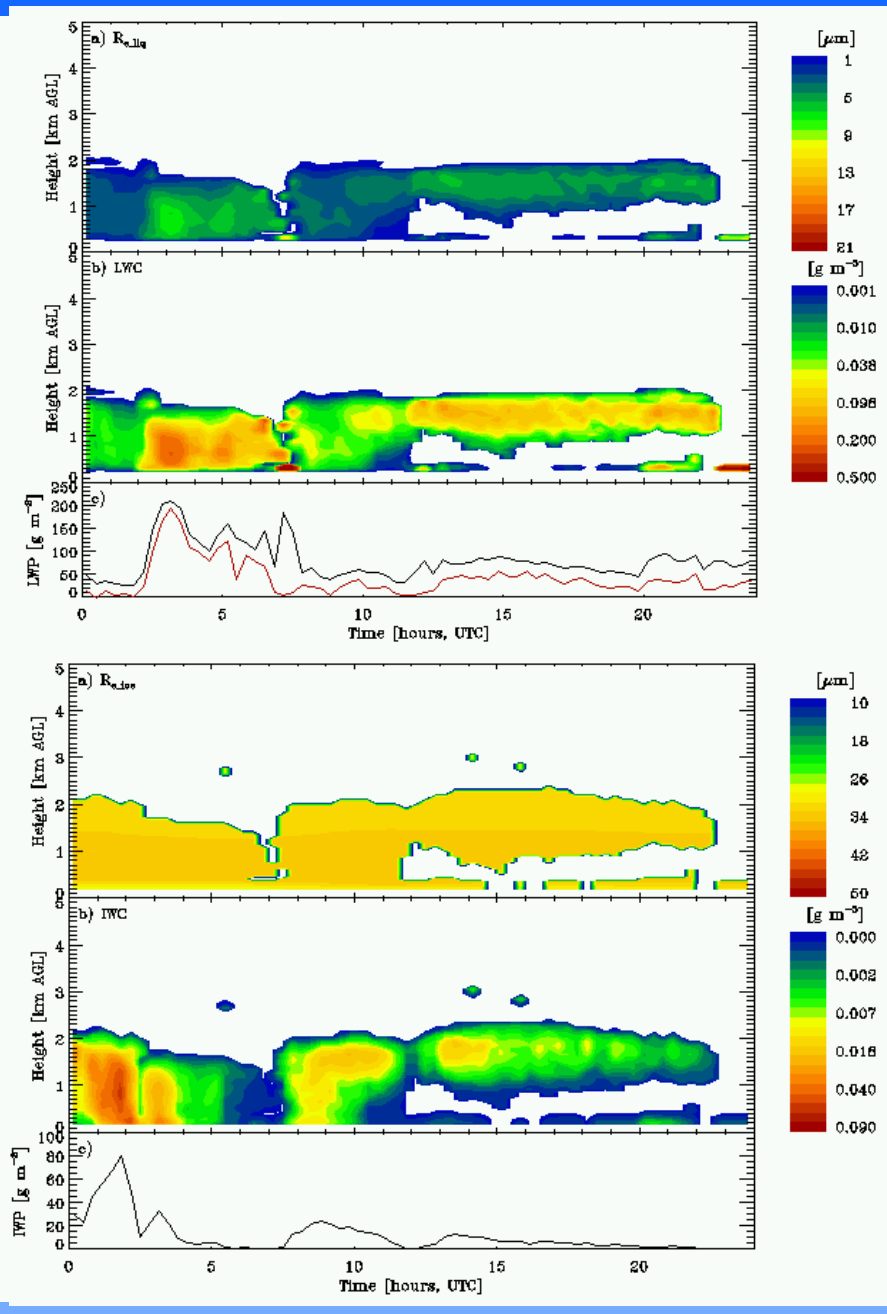
Original

Liquid Properties

Ice Properties





Liquid Properties

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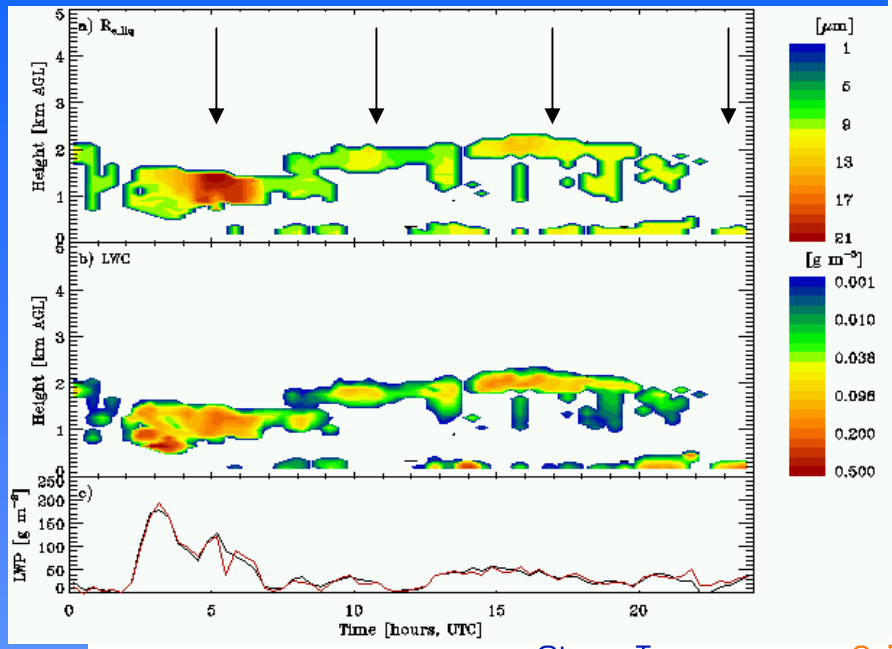
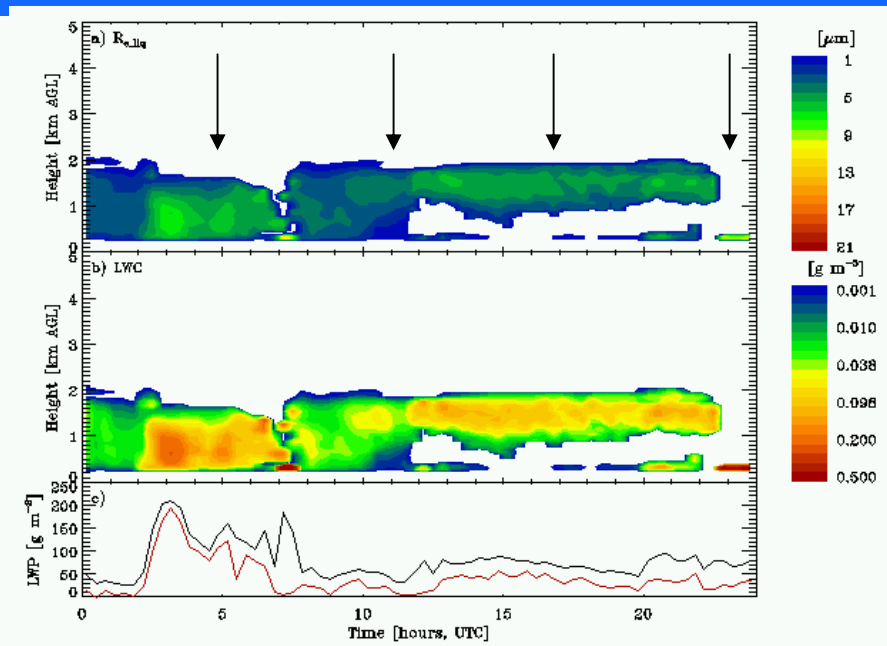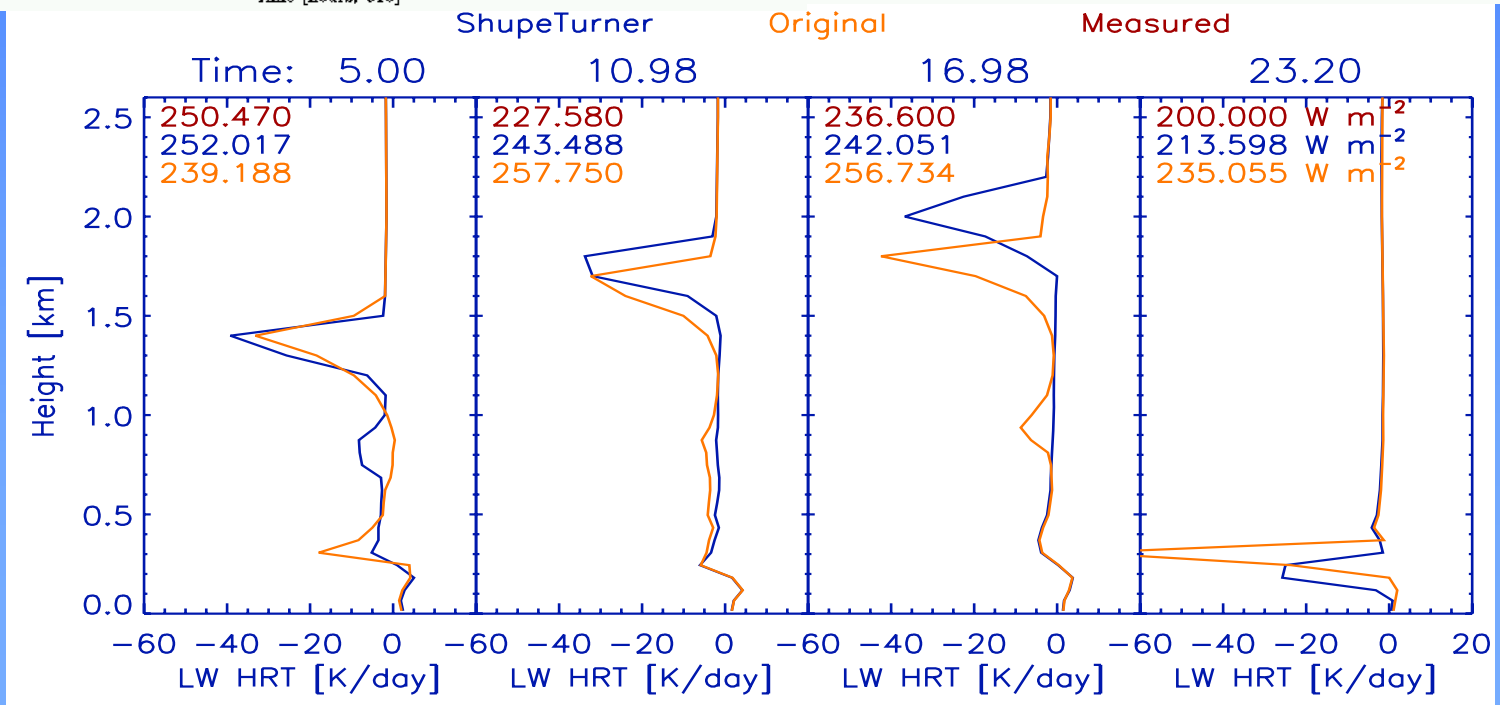
Original