

Data Stream Report

Friday, November 10th 2005

Cloud Properties Working Group Meeting

Mike Jensen

Long – Local Cloud Field QME

Shupe – New Microbase Product

Luke – Micro-ARSCCL and the Insect Mask

Dunn – Proposed upgrades to Microbase

Proposal: Development of a Local Cloud Field Quality Measurement Experiment (LCF QME)

Chuck Long

PNNL

Proposal for new VAP

- Local Cloud Field QME

- combine data/retrievals to produce best estimate of local cloud field macrophysical properties
- “local” here meaning significantly affecting the hemispheric instruments

Inputs:

- TSI (100 Deg FOV, cloud aspect ratio) [also IRSI]
- ARSCCL (temporal cloud fraction, heights, aspect ratio)
- IRT (clear/cloud temp)
- AERI (cloud temp, thin opt depth)
- MFRSR CLDOD (optical depth and effective radius)
- CLD VIS (MPL cloud visible optical depth)
- Flux Analysis (listed variables)

Proposal for new VAP

- use for MicroBase --> BBHRP P_i
 - Can maintain purity for closure analyses by eliminating Flux Analysis retrievals
 - Can include Flux Analysis for “best product”
 - “0th” order: does ARSCL time series represent local cloud field
 - Is 20 minutes of ARSCL appropriate for given situation?
 - Use in conjunction with MicroBase, similar to using MWR and sondes for Merged Sonde
- Fodder for CRM comparisons
- Statistical/climatological analyses



Micro-ARSCl VAP and the MMCR Insect Clutter Mask

Edward Luke¹, Pavlos Kollias¹, Karen Johnson¹,
Eugene Clothiaux²

1. Brookhaven National Laboratory 2. Penn State University



A New Microbase Product:

Adding phase classification, AERI, and multisensor retrievals

Matthew Shupe and David Turner

The General Idea

Input Datastreams

MPL (New Flynn depol product)
Ceilometer
ARSCL
MIXCRA
MWRRET
MergedSonde
(New Turner)



Products

NetCDF

Images

Multisensor Approach:
MMCR moments,
lidar backscatter/depol,
ceilometer cloud base,
MWR-AERI LWP

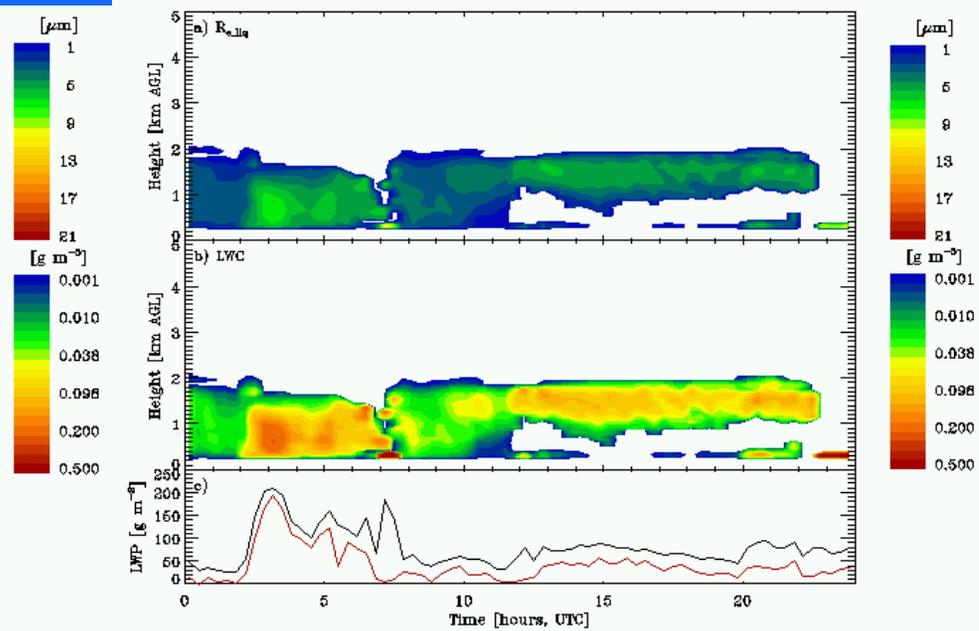
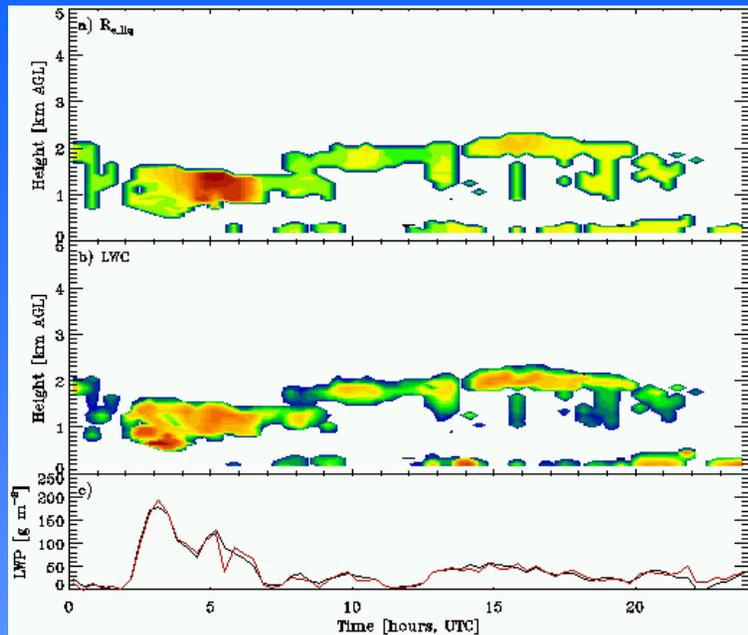
Determines which data
streams are available
and which retrievals are
appropriate for the given
cloud scene

A “smart” combination of methods:
AERI-MWR liquid/ice (Turner)
MMCR ice (Matrosov)
MMCR ice (Shupe)
MMCR liquid (Frisch)
Adiabatic liquid, LWP-scaled

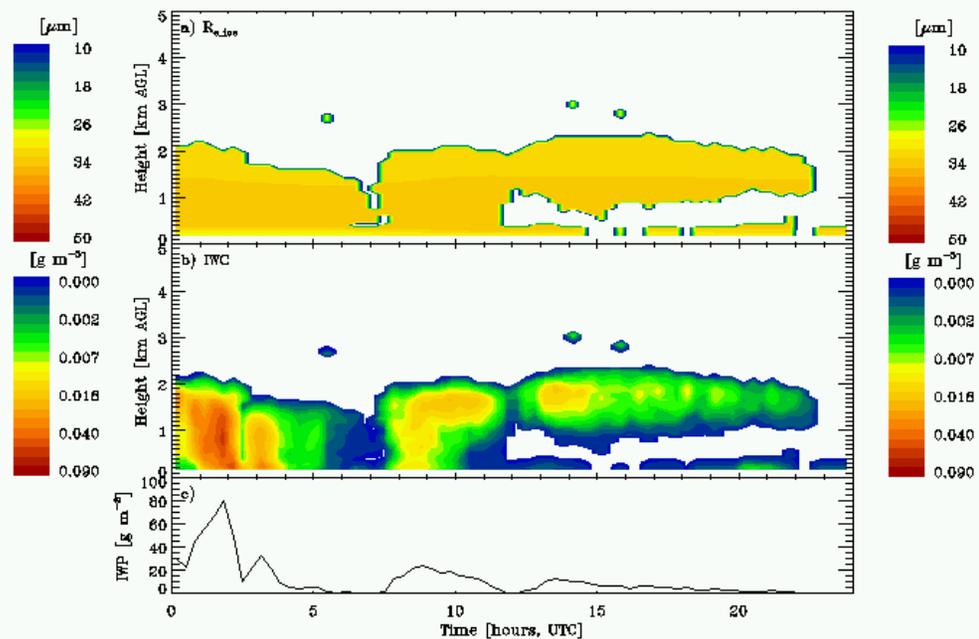
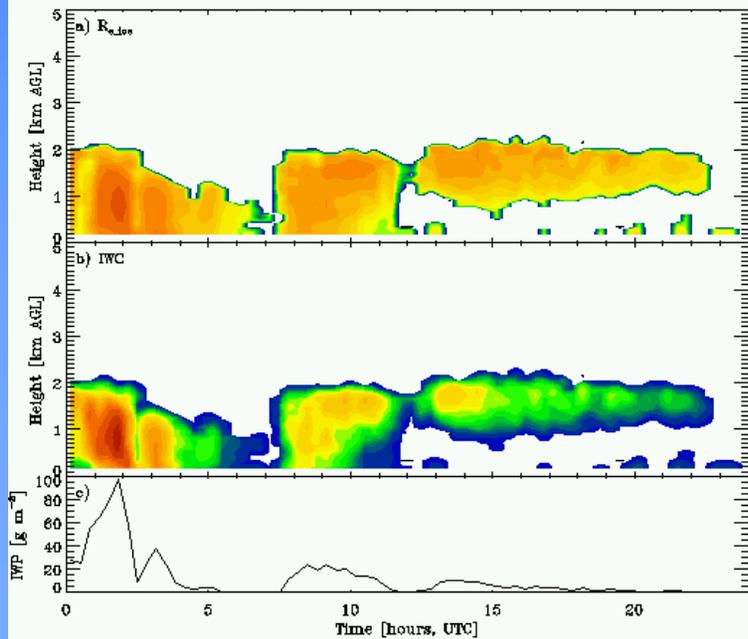
ShupeTurner

Original

Liquid Properties



Ice Properties



Proposed Upgrades to the MICROBASE VAP

Maureen Dunn Pavlos Kollias

Mike Jensen Karen Johnson

Mary Jane Bartholomew Ed Luke

David Troyan Mark Miller

Upgraded MICROBASE

ARSCL
MMCR (35GHz), MPL, Ceilometer

Micro ARSCL

Cloud Type Classification
(Kollias et al 2006)
Precip - Low bl - Mid - High

Disdrometer

Phase Identification
(Doppler Spectra)
(Kollias et al 2003)

LIQUID - MIXED - ICE

LWC

IWC

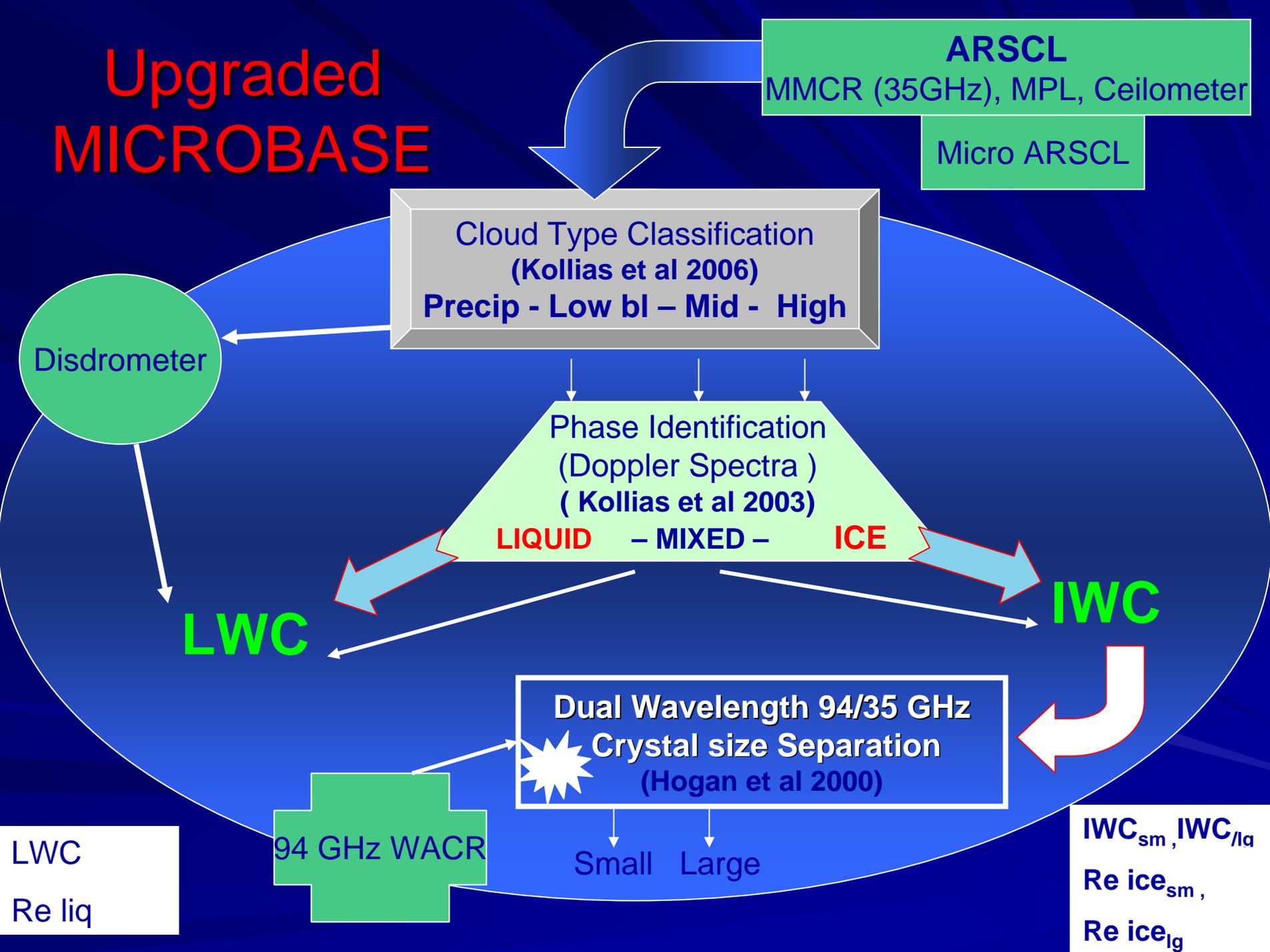
Dual Wavelength 94/35 GHz
Crystal size Separation
(Hogan et al 2000)

94 GHz WACR

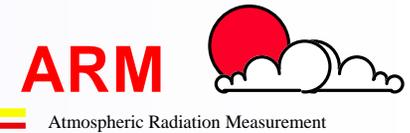
Small Large

IWC_{sm}, IWC_{lg}
 $Re_{ice_{sm}},$
 $Re_{ice_{lg}}$

LWC
Re liq



Working Group recommendations: Prioritization of Translator Tasks



VAP QA/QC monitoring

VAP production for cases where autonomous operation is either not possible or not cost-effective.

- i.e. ARSCL, MicroBase, MergedSonde

Updating and repairing VAPs, including QC flagging

Updating web pages, technical reports, and documenting data format/content for VAPs currently in production

Recommendations

- LCF QME – Group did not make recommendations. However, resolving issues related to cloud field macrophysical properties observed by pencil beam vs. hemisphere is important for BBHRP and other applications.
- Shupe/Turner Microbase product – Produce as a PI product for 1 year at NSA and evaluate vs. current microbase within BBHRP framework
- Kollias et al. Cloud Classification – Produce as a PI product
- Radar spectra phase classification is recommended for further development towards producing a VAP