

RPWG Breakout Session

1:00-1:20 Sally McFarlane – VAP update + aircraft albedo experiment

1:20-1:35 RSWG Priority Discussion

Research talks:

1:35 Jennifer Delamere – SW QME update

1:45 Lazaros Oreopoulos – CIRC

1:55 Ibrahim Reda – Recent Results of Pyrgeometer Calibrations
Traceable to the World Infrared Standard Group.

2:05 Tom Stoffel – Results of AMF/GNDRAD Reconfiguration on
Upwelling Irradiances.

2:10 Jean-Charles Dupont - Observed cirrus cloud radiative forcing on
surface-level shortwave and longwave irradiances

2:20 A. Marshak - Studying the Transition from Cloudy to Clear
Skies Using the ARM Shortwave Spectrometer

2:30 C. Chiu - Preliminary retrievals of cloud properties from the
AMF/COPS campaign

2:40 Qilong Min - Oxygen A-band

2:50 Anthony Davis – A-band data exploitation

Radiative Processes Working Group Value Added Product (VAP) Updates

Sally McFarlane, Chuck Long
Krista Gaustad, Yan Shi, Tim Shippert
RPWG Translator/Developer Team

Status of RPWG Operational VAPs

- BE Flux (Best Estimate Flux from 3 radiometers at SGP)
 - run daily up through current
- QC RAD (Data Quality Assessment for Radiation Data)
 - C1 level data - current at all fixed sites
 - C2 level processed yearly as radiometers are swapped out; waiting for info on radiometer swaps at TWP/NSA
- SW Flux Anal (Shortwave Flux Analysis)
 - Runs monthly on all fixed sites except Darwin (processed once/year); 1-2 months behind current
- SFC Cld Grid (Surface cloud grid)
 - Run twice/year - currently processed through Oct, 2007
- SW Diff Corr (Shortwave Diffuse Correction)
 - Recently corrected NSA data based on info from NSA Radiometer IOP
 - All data have been sent to archive; **VAP ready to be retired**

RPWG Development VAPs

- ▶ SfcSpecAlb (Surface Spectral Albedo)
- ▶ QCRad for AMF deployments
- ▶ BBHRP (Broadband Heating Rate Profile)

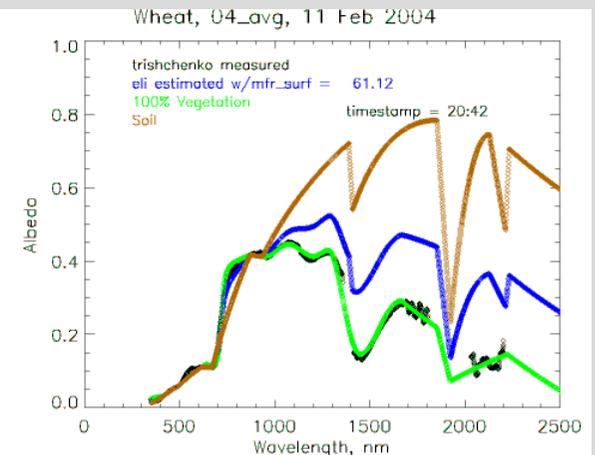
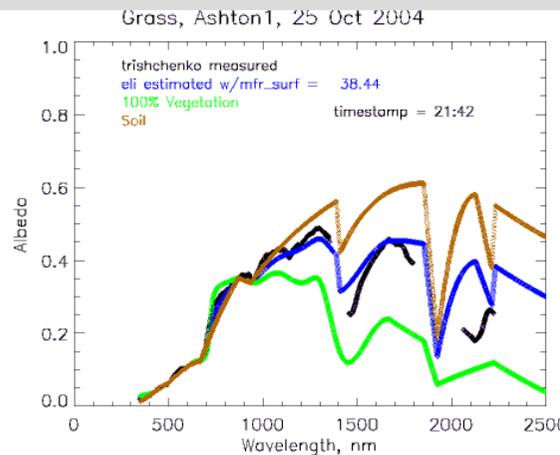
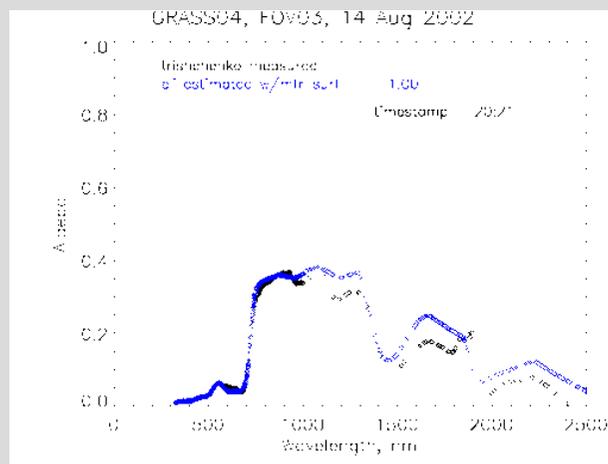
SfcSpecAlb (Surface Spectral Albedo)

Krista Gaustad, Sally McFarlane, Chuck Long,
Eli Mlawer, Tim Shippert

- ▶ Objective: produce high-resolution surface spectral albedo for use in radiative transfer calculations
 - Based on methodology developed by Eli Mlawer for BBHRP
- ▶ Uses 6-channel upward-looking MFRSRs and downward-looking MFRs on 10m and 25m towers at SGP
 - Quality assess upwelling and downwelling broadband and spectral irradiance values; fill in missing values
 - (This QC'd albedo currently available as 'Evaluation Product')
- ▶ Predict surface type
 - snow, brown, vegetated, or partial vegetation
- ▶ Extrapolate to high-resolution, wider spectral range
 - Algorithm developed by Mlawer uses information from spectral albedo libraries to predict behavior in extended spectral range given surface type and albedo at MFR wavelengths
- ▶ Poster by Krista Gaustad on Wednesday

SfcSpecAlb Status

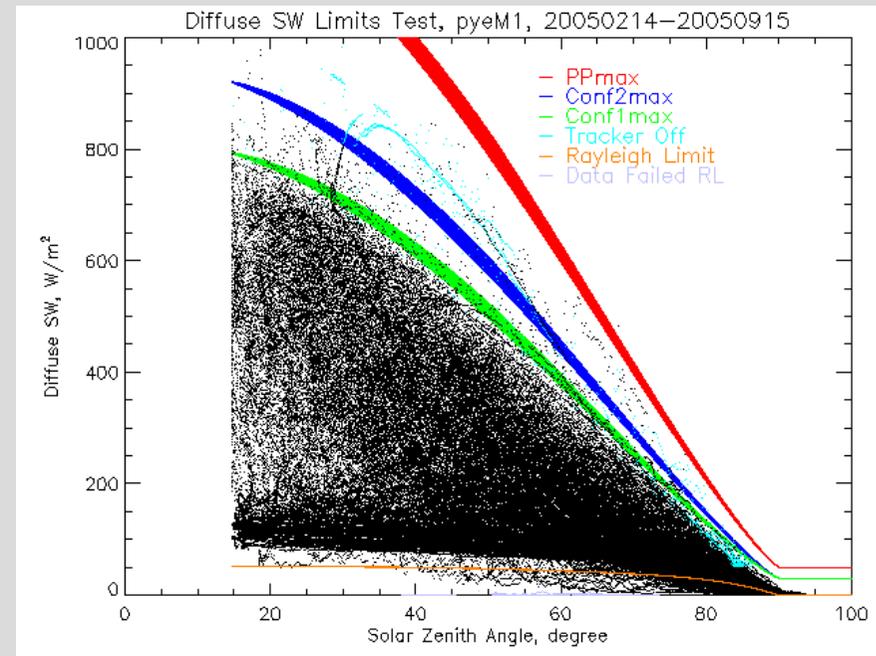
- ▶ Surface type classification improved and evaluated (using Total Sky Imager and observer logs)
- ▶ Original method for identifying percent vegetation adjusted
- ▶ Evaluating percent vegetation and spectral extrapolation by comparing to detailed spectral measurements taken by Trishchenko at SGP
- ▶ Initial evaluation shows:
 - Method performs well for single vegetation type (left); regions beyond 1 um tend to be slightly overestimated
 - Percent vegetation estimate performs well in some cases (middle); often appears too low in cases of partial vegetation (right)
 - Issues at 2-2.5 um in some cases need to be resolved



QC Rad for AMF Deployments

Yan Shi, Chuck Long, Sally McFarlane

- ▶ QC Rad is the ARM recommended radiation measurement datastream
- ▶ Requires climatological limits to assess radiation data; these must be adjusted manually for each site
- ▶ Beta version of data available for Pt. Reyes and COPS deployments; beginning Niamey analysis
- ▶ Poster by Yan Shi on Wednesday



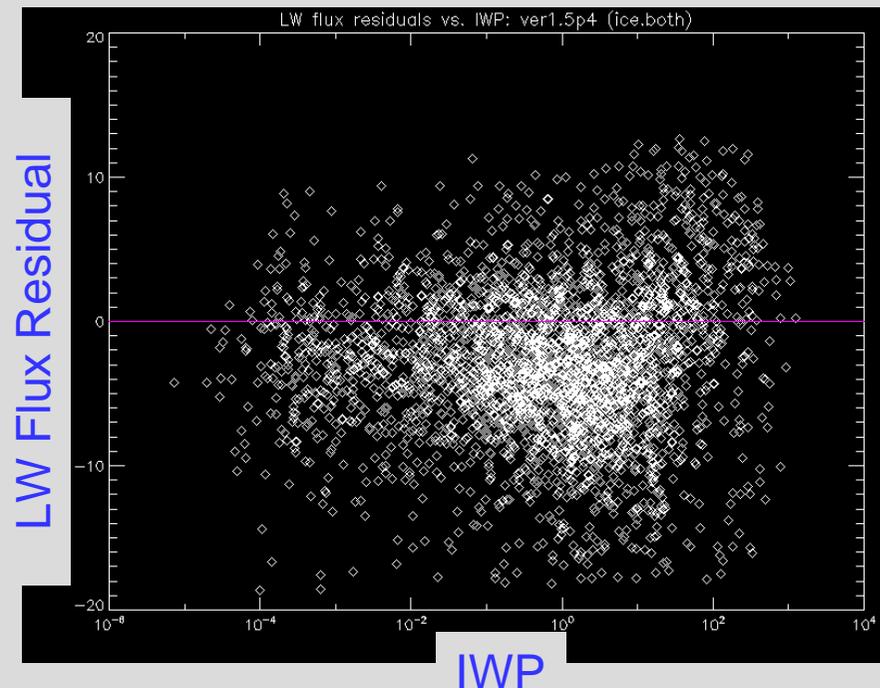
QCRad results for diffuse SW at Pt. Reyes, note tracker off points (cyan) caught by algorithm

BBHRP (Broadband Heating Rate Profile)

Tim Shippert, Eli Mlawer, Sally McFarlane

1 year of BBHRP calculations (Mar 2000 – Feb 2001)
from SGP to be released as 'Evaluation Product'

- Current product consists of 30-min average files using MicroBase input; 1-min data released by end of month
- Calculated broadband heating rates and fluxes plus residuals with respect to surface/TOA measurements
- Trials with other cloud products available upon request
- Analysis plots available on BBHRP web page



Surface LW residuals for all ice clouds

BBHRP cont.

▶ Long-term dataset

- Will process additional years of data at SGP for which Microbase and MergedSounding are available
- 1 year of calculations at NSA under evaluation
- TWP requires additional development effort for surface albedo and aerosol
 - Initial runs may be done without aerosol
 - Surface albedo must be derived separately for each site

BBHRP Community Testbed

► Concept

- Use BBHRP framework as community testbed for PI cloud retrievals
- PIs will be able to submit retrievals for SGP and NSA periods that have been processed through reference version
- Some 'historical' algorithms have already been processed at SGP; and Shupe-Turner at NSA
- Use of testbed for current retrieval algorithms will require PI effort to put retrievals in required formats

► Current Efforts

- Working on documentation of BBHRP process and input datasets
- Planning improved modularization and updates to code
- Beginning CLOWD Pt Reyes intercomparison (organized by Comstock/Vogelmann/Turner)
- More details at BBHRP break-out session (Tues 1-5 pm)

Upcoming RPWG VAP Efforts

- ▶ Full Radiative Flux Analysis (RFA)
 - Listed as very important in RPWG survey
 - Adds LW information to SW Radiative Flux Analysis
 - Will include revamping of SW codes to make processing more efficient
 - RFA data at multiple sites soon available as PI Product (Long)
- ▶ QCRad for AMF deployments to Niamey and China
- ▶ Work with Data Quality Office to understand new VAP QC flags – QC Rad is test dataset
- ▶ Update VAP documentation and QC flagging info
- ▶ Continue development on SfcSpecAlb and BBHRP

Potential VAP Efforts For Discussion

- ▶ SW Flux Analysis for AMF
 - Modest effort required for Pt. Reyes, COPS
 - More substantial effort required for Niamey and China due to heavy aerosol loading
- ▶ AERI noise filter
 - Improve/update processing code
- ▶ GVR 183-GHz Radiometer
 - MWRRET-type retrieval that includes statistical (Cadeddu) and physical retrievals
- ▶ Other VAPs?
- ▶ Instrument simulators or other software 'tools' needed to work with ARM data?

Routine Airborne Spectral Surface Albedo Measurements

An AVP Pre-Proposal

S. McFarlane, J. Delamere, G. Hodges, C. Long, J. Michalsky,
E. Mlawer, C. Schaaf

▶ Objective:

- Routine mapping of spectral surface albedo over the SGP central facility over a complete seasonal cycle and a range of cloud conditions

▶ Scientific Focus of Campaign

- Improve shortwave radiative closure agreement through characterization of the areal-mean spectral surface albedo around the SGP central facility under clear and cloudy conditions.
- Assess current surface albedo products from MODIS and the ARM Surface Spectral Albedo Value-Added Product.

▶ Selected to submit full proposal