# Quality Control Tools at the ARM Climate Research Facility Data Quality Office

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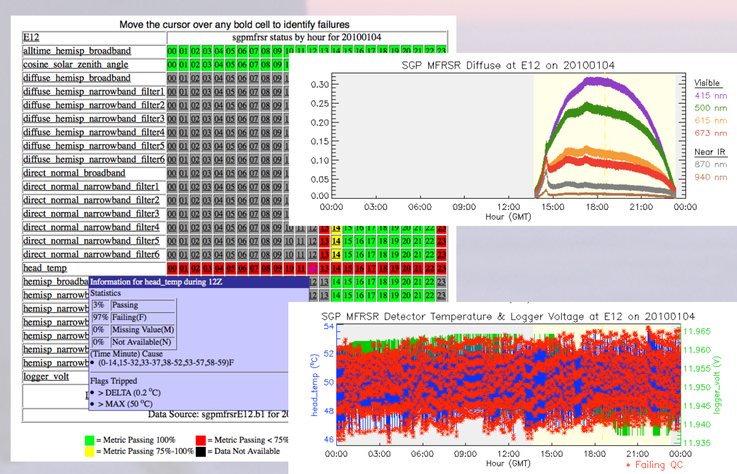
## Data Quality Office

### Overview

- Develops tools and procedures to perform automated and manual data quality (DQ) inspection of over 5000 different measurements from 350 datastreams
- Processes ~500 MB of data each hour and creates over 3000 plots per day
- Uses metric tables and plots to inspect the data and identify sensor failures
- Summarizes results in weekly DQ Assessment reports sent to key personnel
- Creates DQ Problem Reports to track and resolve detected problems




- Uses NCVweb to interactively inspect the data and accurately determine the specific onset of DQ problems
- DQ Reports are delivered to data end-users to document problems
- Collaborates with ARM infrastructure and ASR scientists to develop new tools and DQ routines

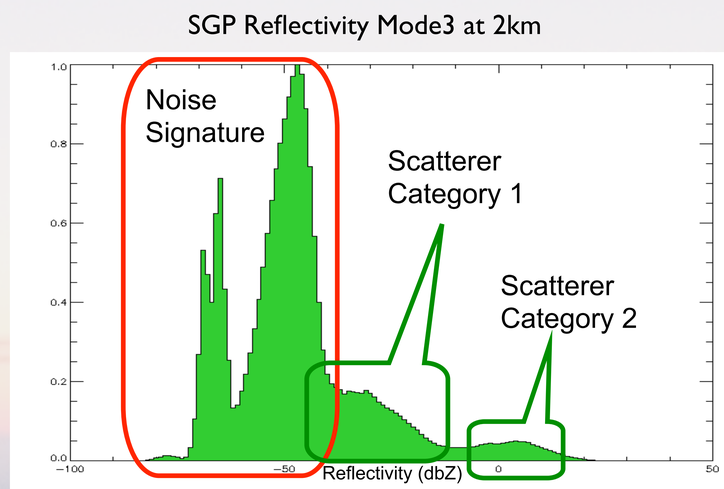
### Recent Data Quality Tools

- Automated e-mails summarizing instrument stability
- Notifications of calibration changes
- Long-term datastream statistics to detect shifts or unusual trends indicating possible DQ problems
- Millimeter Wavelength Cloud Radar (MMCR) tools
- G-Band Vapor Radiometer (GVR) tools

## MMCR Tools

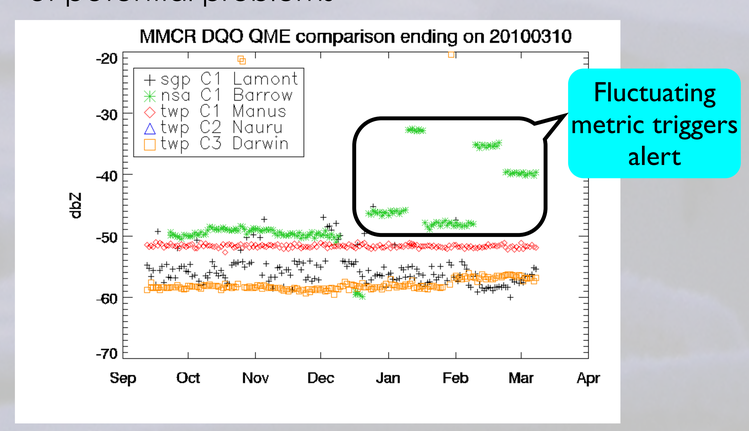
### Millimeter Wavelength Cloud Radar

- Track scatterer classification over many years to validate radar calibration

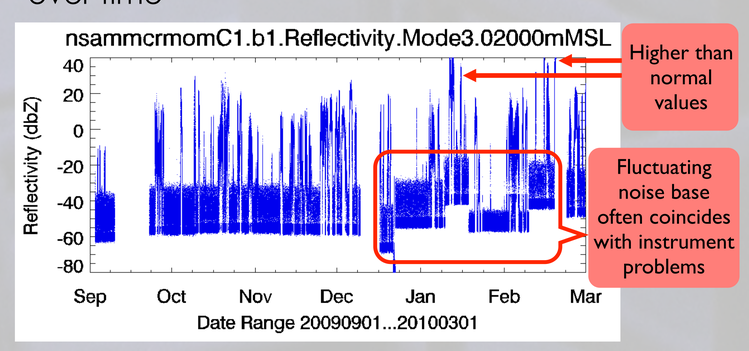



Distribution over period of 6 years
(9/27/2003 to 8/24/2009)

- Simplified daily metric to alert instrument mentor of potential problems




- At-a-glance assessment of instrument stability over time



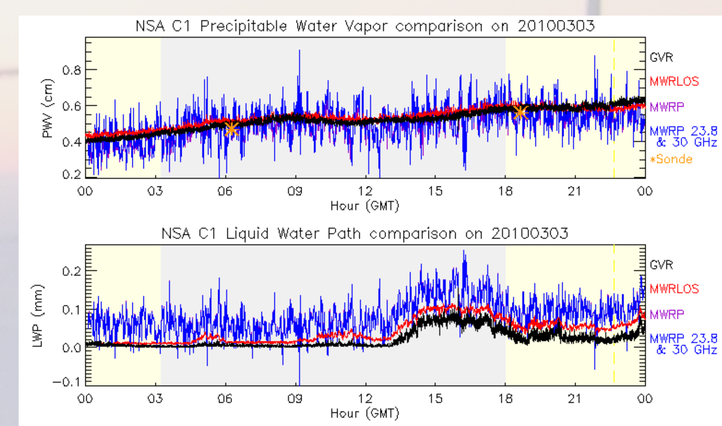

## GVR Tools

### G-Band Vapor Radiometer

- Implemented an algorithm[1] which uses GVR brightness temperatures to estimate liquid water path (LWP) and precipitable water vapor (PWV)

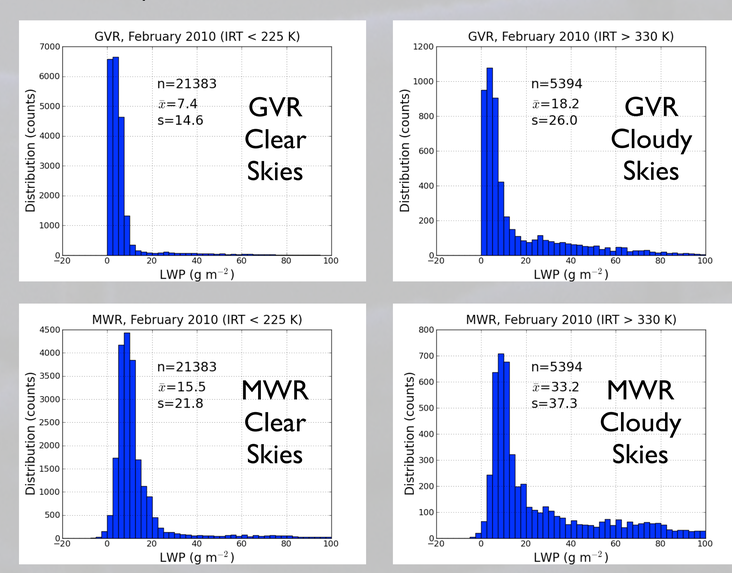
### Comparison Plots

- PWV (top) and LWP (bottom) values from the NSA Microwave Radiometer (MWR, red), MWR Profiler (MWRP, blue/purple), and GVR (black)




### LWP Distributions

- Time-synchronized comparison of estimated LWP indicates that GVR retrievals have less variability and return less liquid than MWR retrievals from February 2010




[1] M.P. Cadeddu, D. D. Turner, and J. C. Liljegren, "A Neural Network for Real-Time Retrievals of PWV and LWP from Arctic Millimeter-Wave Ground-Based Observations", *IEEE Trans. Geosci. Remote Sens.*, vol. 47, no. 7, pp. 1887-1900, Jul. 2009.



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