

RICO S-PolKa Radar Data Availability and QA



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With extensive contributions from

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All Results are Preliminary

RICO Data Workshop, Boulder, CO 27-Jun-2005
And RICO Data Workshop II, Boulder, CO 18-Jan-2006



Three Main Concerns

- Availability
- Reliability
- Usability



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Below
Sea-level!

http://www.atd.ucar.edu/rtf/projects/rico2004/spol/photos/Panorama/Spol_RICO_pano.html

Availability

- [RICO S-PolKa information](#) (still building!)
- [Data Matrix](#)
- [Scan Images](#)
- [Parameter Matrix](#)
- Data Access
 - This workshop (11-var, S/K data)
 - [Web Access](#) (MSS proxy for 9-var, S-Only)
 - Web Access, full data set pending
 - (Former) JOSS [Field Catalog](#)

Reliability

- S-band is stable
 - Zdr bias correction (+0.36 dB added to Zdr)
 - S-band reflectivity (1.4 dB added)
 - Some processor drop-outs early in project
 - Some scan delineation issues
- Ka-band
 - Episodic changes
 - Calibration issues
 - Stability concerns
 - Other known DQ issues

Other Ka DQ Issues

- Low-level blockage
- Calibration and Power stability
- Unknown calibration (Ellis S/Ka comp)
- Ghost echoes
- [Ongoing report](#)

Generic Ka Limitations

- Highly attenuated frequency
- Subject to Mie scattering
- Subject to differential Mie scattering
- Small Nyquist
- Electronics are somewhat unstable (temperature sensitivity, frequency drift)
- Magnetron system (lower power, limited control)

Why Ka?

- Sensitive to small cloud drops
- Insensitive (mostly?) to Bragg scattering
- Potential for new insights using Zdr (and other polarimetric variables) at Ka
- Insensitive to clutter
 - $\lambda^{3.9}$ dependence (Kropfli and Kelly, 1998)
 - Would greatly limit sea clutter (but siting made this unnecessary)
- Potential for vapor and liquid water measurement through S/Ka differential attenuation (Ellis)
- Excellent signal statistics

Ka Best Use(?) in RICO

- Bragg scatter discrimination
- Differential measurements
 - S minus Ka for water vapor or liquid estimates
- Early-echo case studies
- Small droplet discrimination
- Other? (e.g., bird discrimination?)
- What do the RICO PIs think?
- Help and expertise available from EOL!
(we're anxious to see the Ka put to good use)



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Comments on S-PolKa?

(It's all on the Web?)

The end of this section.

On to the Antenna Camera.

S-PolKa Antenna Camera



Why the Camera?

- PI request at time of approval
- Completes sensor complement for “first echo” studies

Limitations

- Haze
- Clouds
- Daytime only
- No ranging information
(stereo camera?? – I don't think so.)

Camera Data Set

- 60 days x 12hrs/day x 3600sec/hr x 2/sec
- 5 million images
- Resolution 640x480 pixels, jpg format
- Total on-disk size of about 120 GB
- About 2 GB/day
- One image every 4-deg antenna rotation

(really needed a tool to review these)

AntCam Viewer

- Browser-based, uses Javascript
- Loadable to local disk
- Sorts and displays images based on:
 - Date/time
 - Scan type, scan elevation
 - Azimuth
 - Upon clicking echo
 - Echo tracking between multiple scans

AntCam Viewer Demo



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Local Disk Demo

AntCam Distribution

- Not suited for use over most InterNet
- ftp files are in 2 GB/day units
- May have option of writing zip files to DVD

Issue of over-all Utility...



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And now, over to Scott Ellis