Micro-ARSCL VAP and the MMCR Insect Clutter Mask

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<u>Micro-ARSCL</u> packages cloud boundary estimates with MMCR moments plus additional measures of spectrum morphology descriptive of atmospheric ***<u>microphysical</u>*** state.

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Micro-ARSCL provides

- cloud boundary estimates
- five primary-peak moments
- full-spectrum reflectivity
- measurement uncertainty of first three moments
- primary peak left & right slopes
- sub-peak velocities and reflectivities
- de-aliasing and spectral artifact removal
- insect clutter detection, saturation, pulse-coding flags

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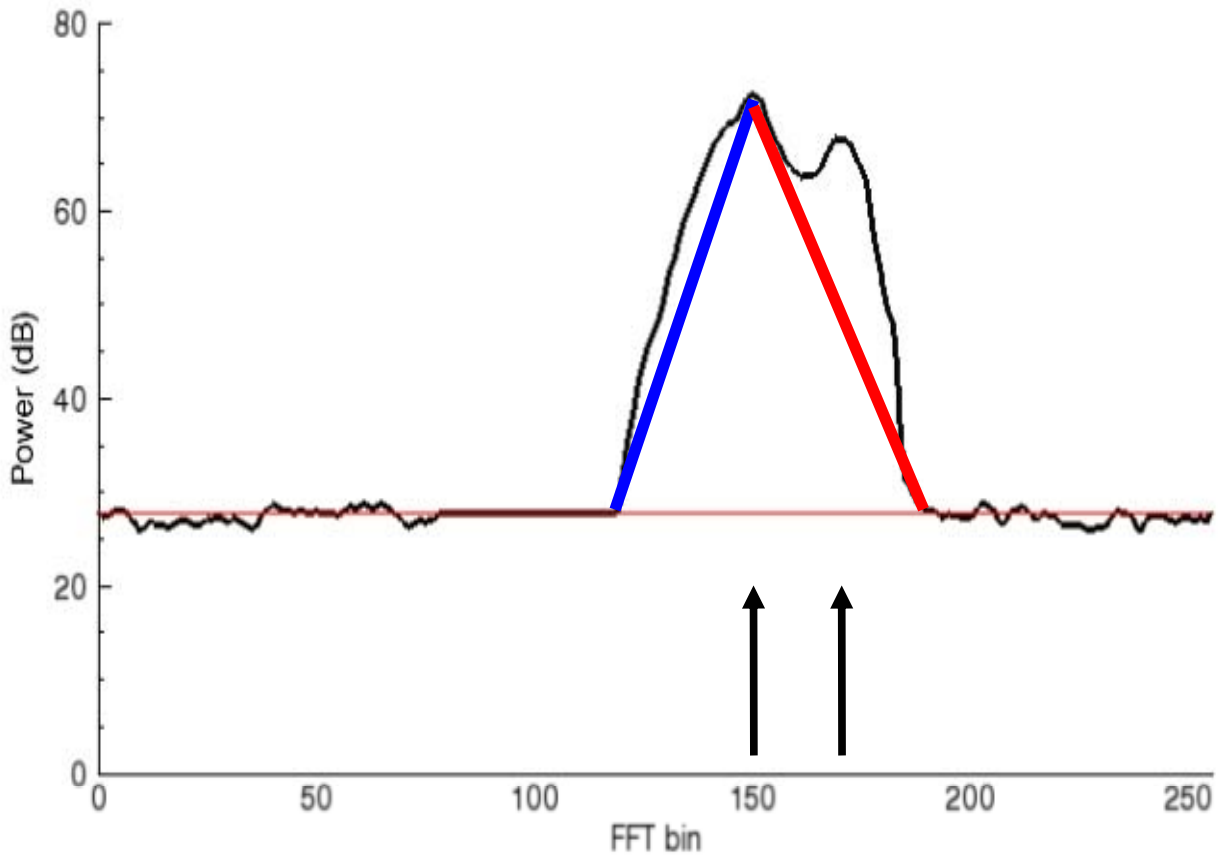
Spectrum Morphology Measures



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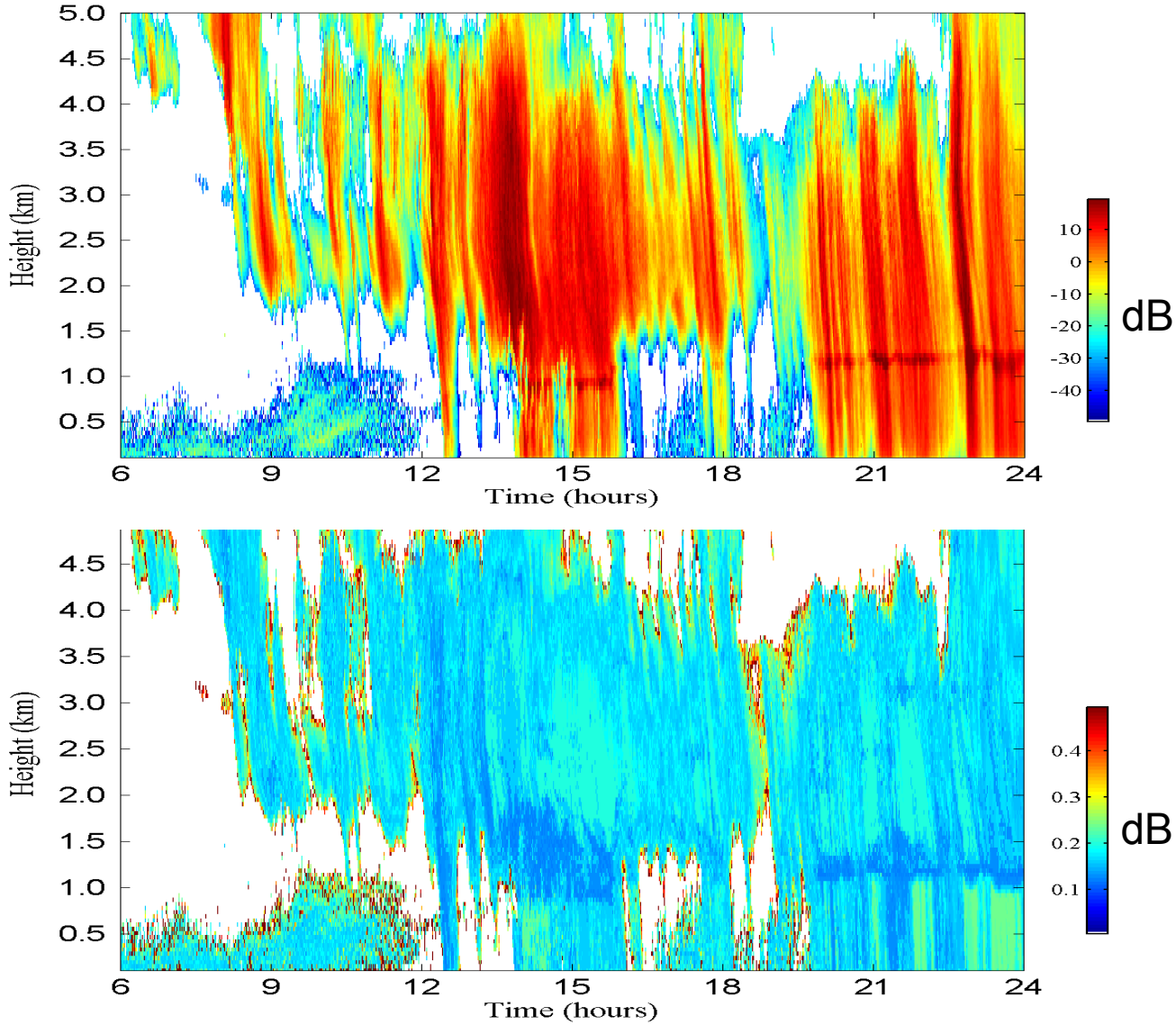
Reflectivity and Uncertainty Estimates



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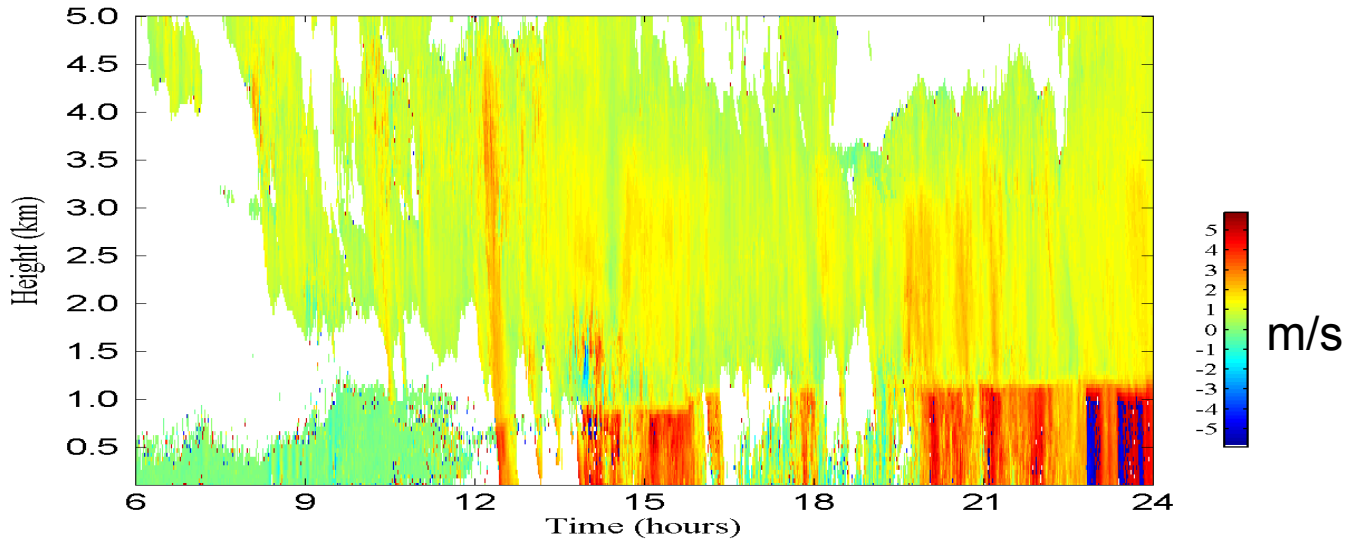
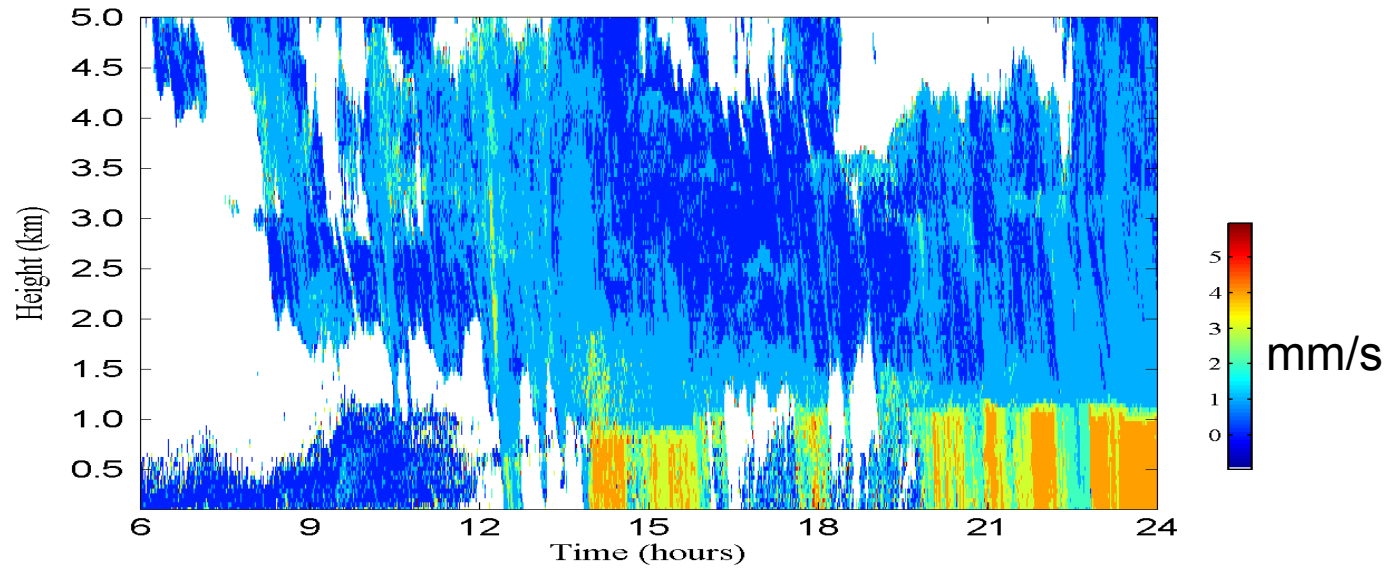
Mean Doppler Velocity and Uncertainty Estimates





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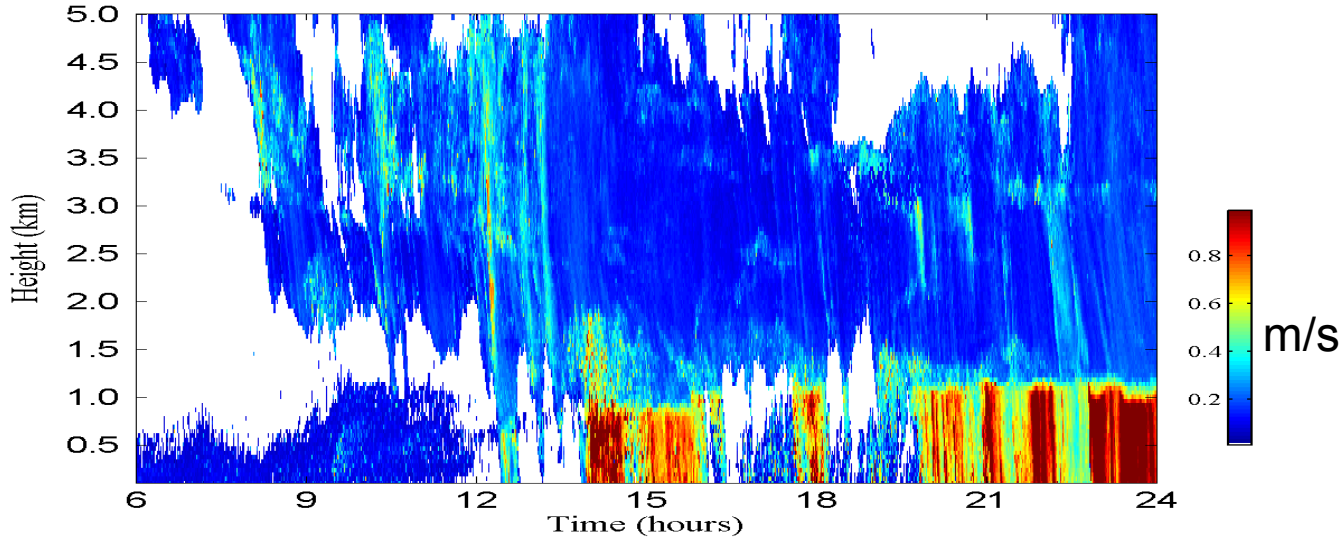
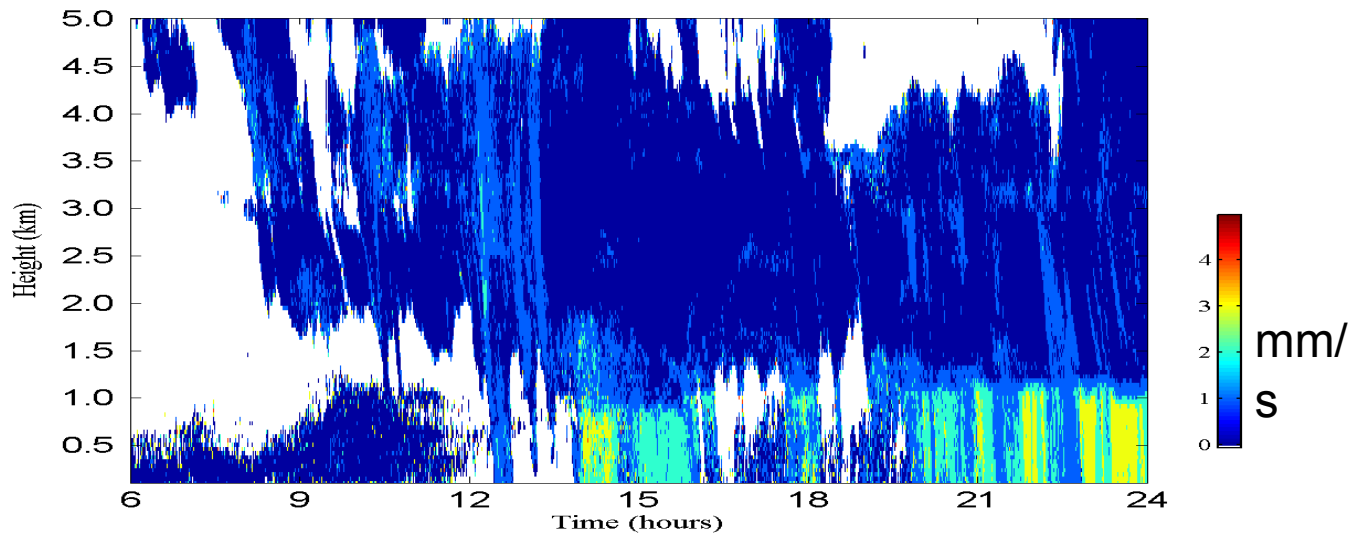
Spectral Width and Uncertainty Estimates





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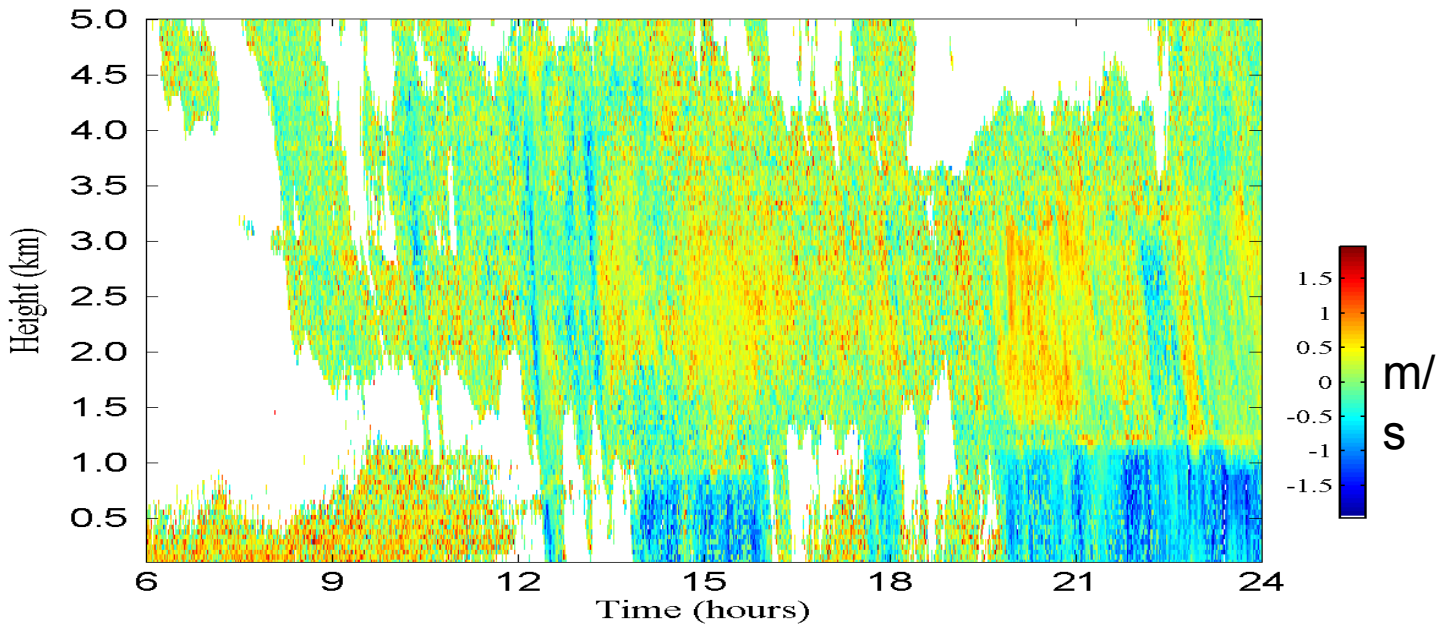
Primary Peak Skewness



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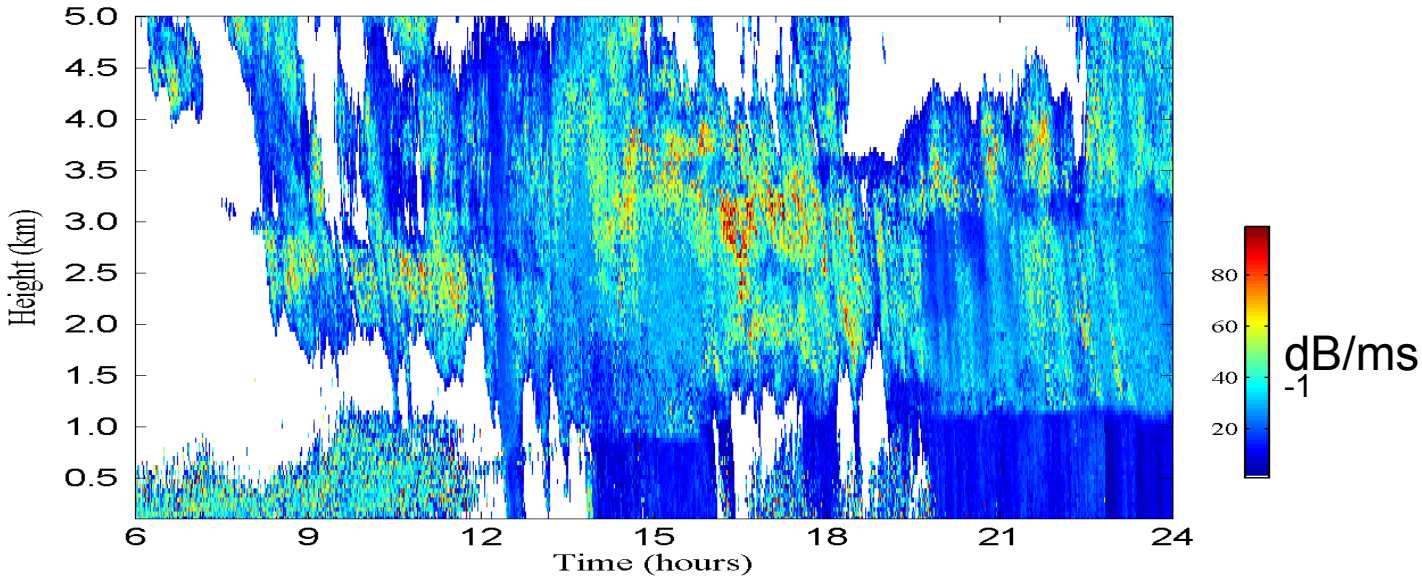
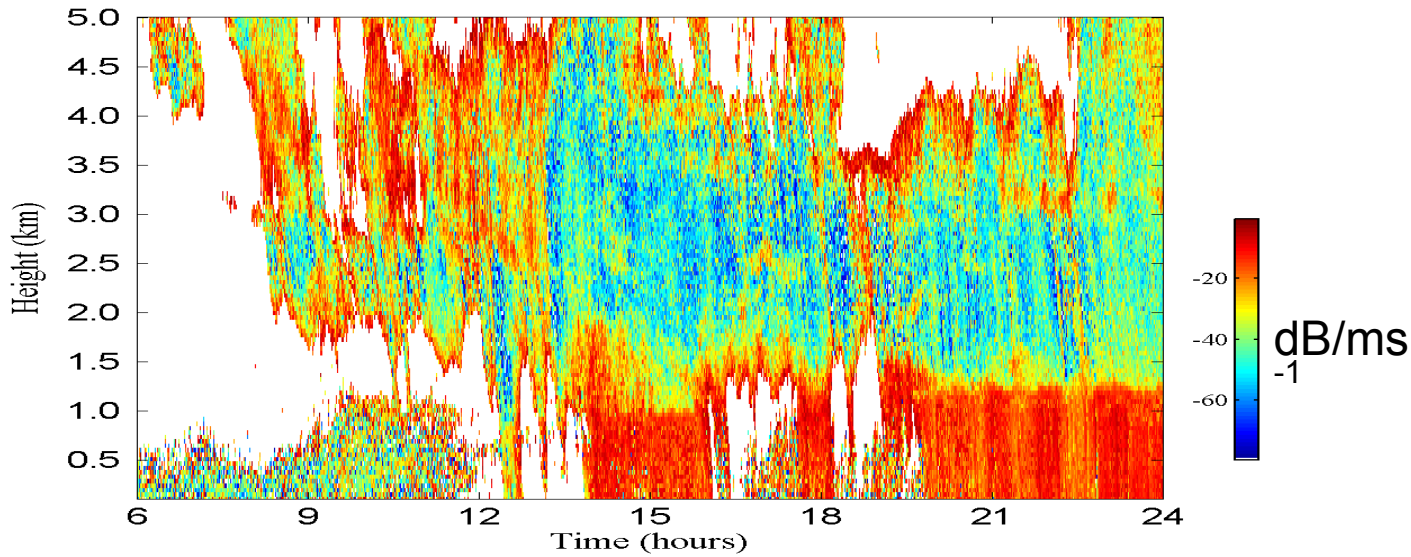
Primary Peak Left & Right Slopes





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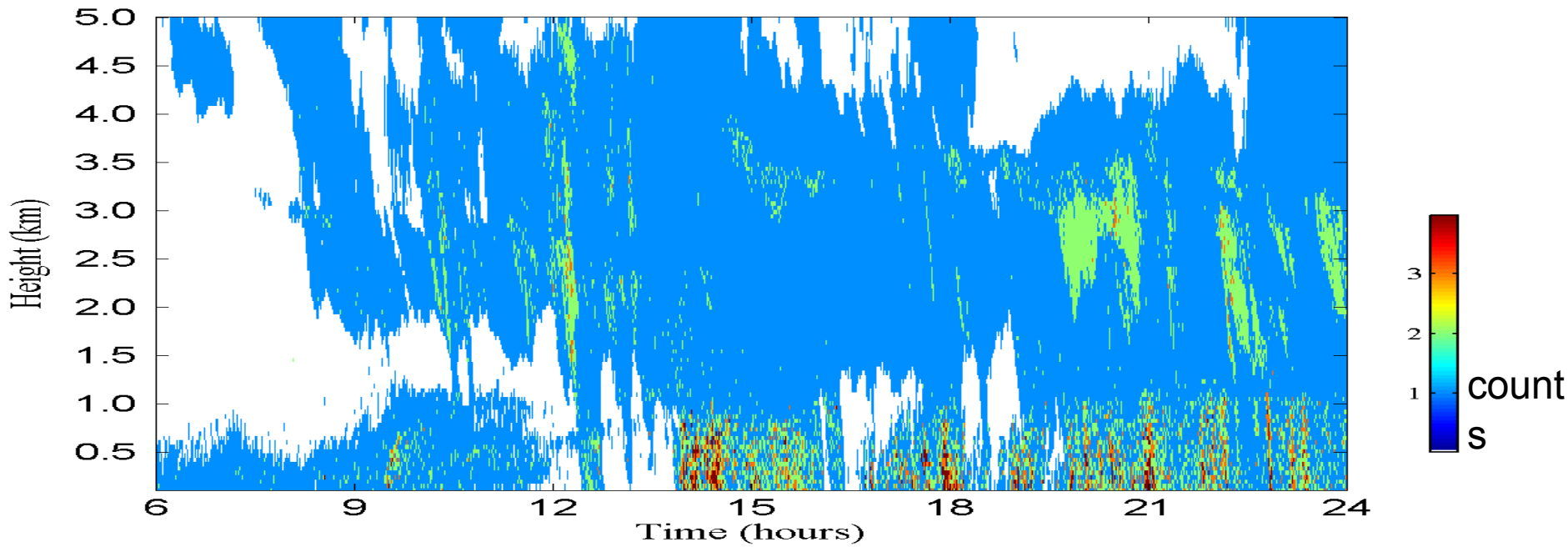
Spectral Sub-peak Counts, Reflectivities, & Velocities



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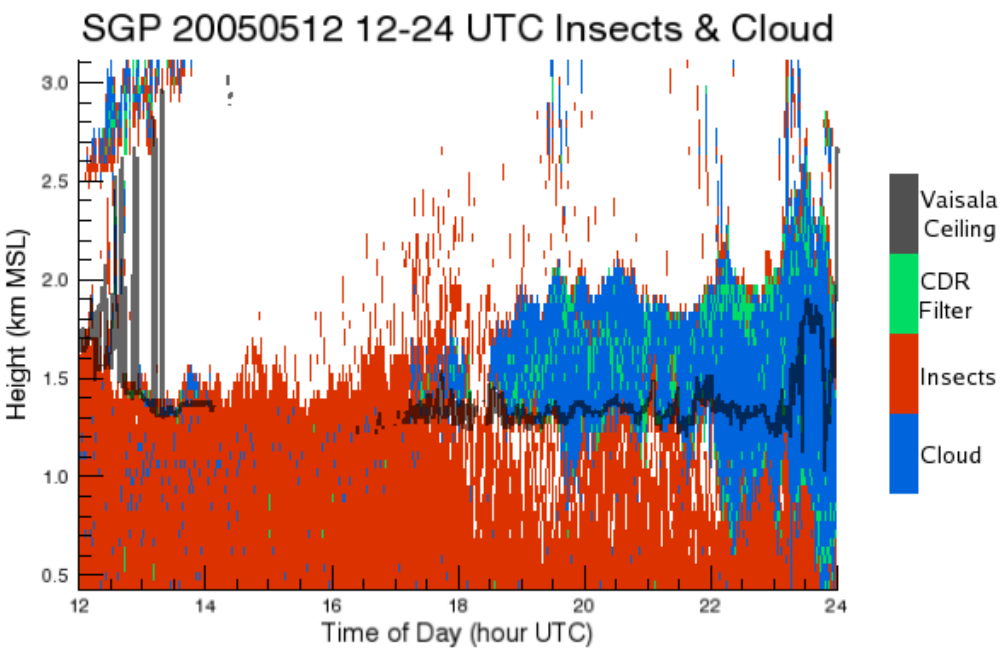
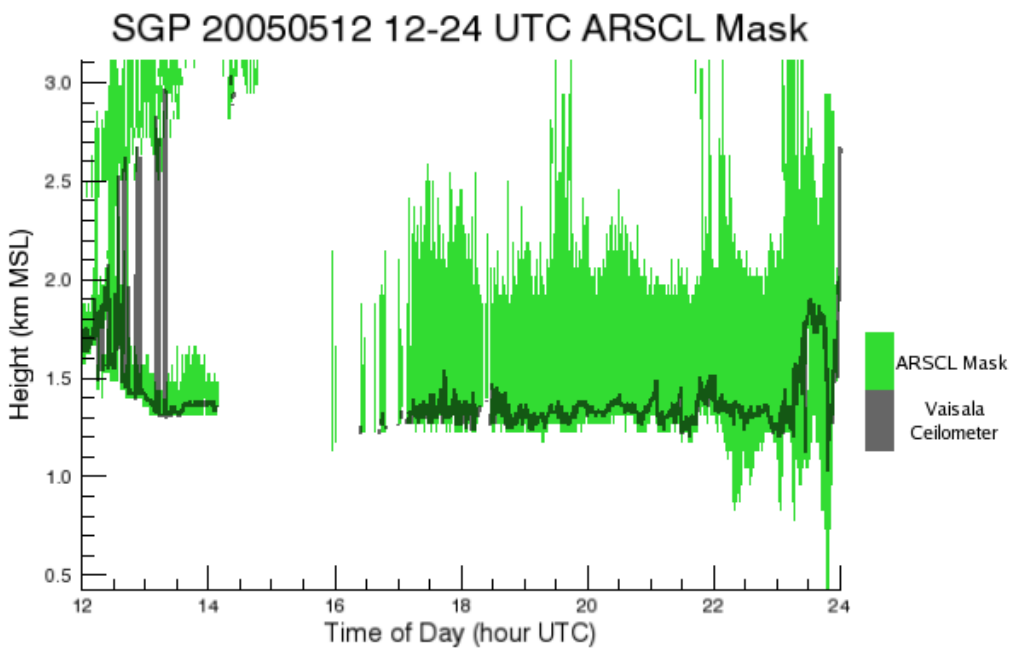
Insect Mask





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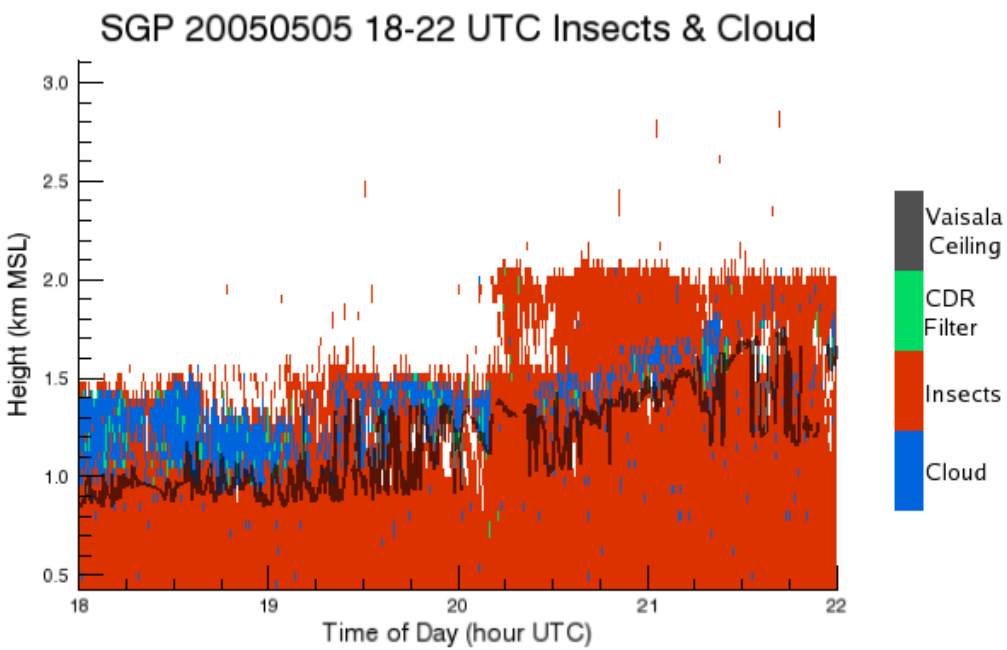
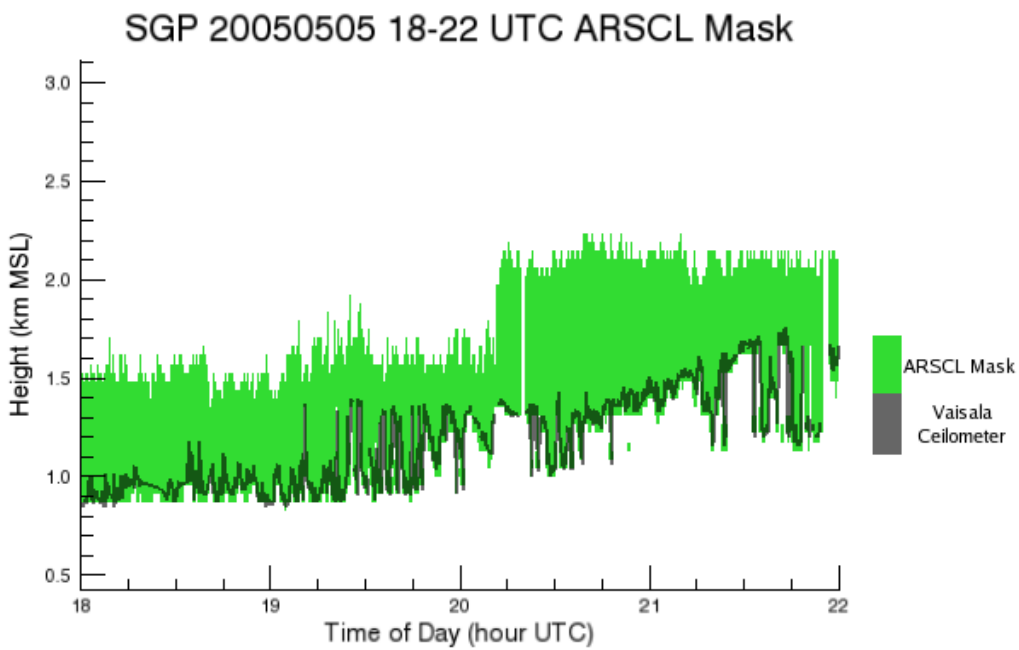
Cloud Embedded in Insects





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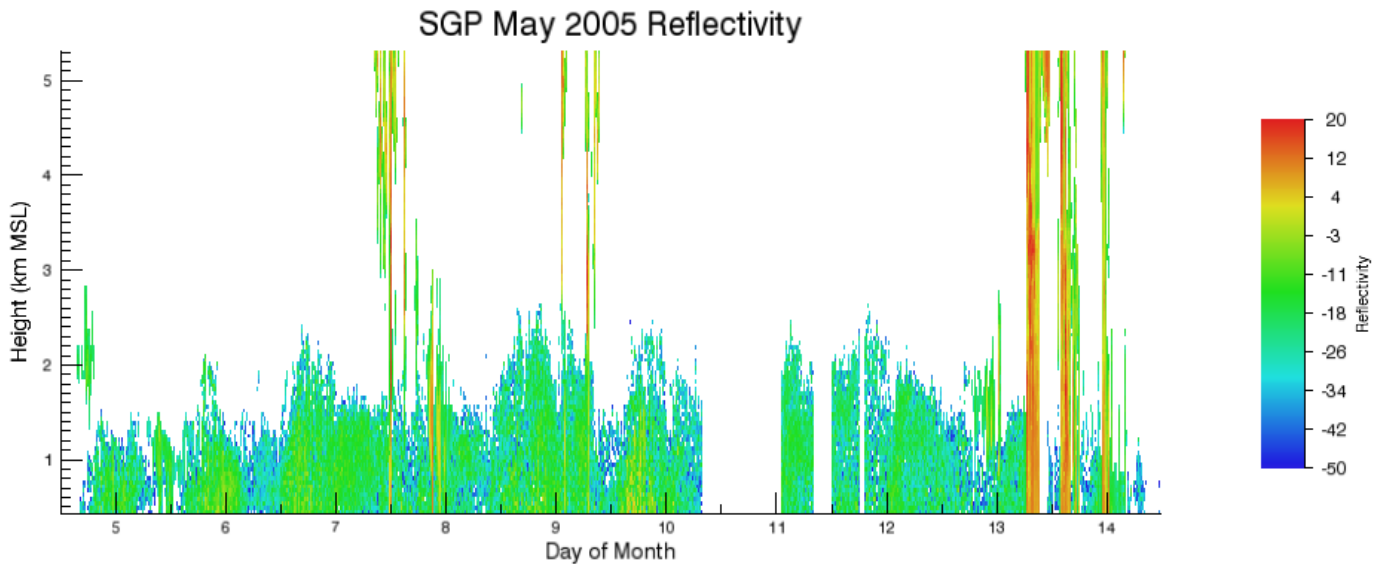

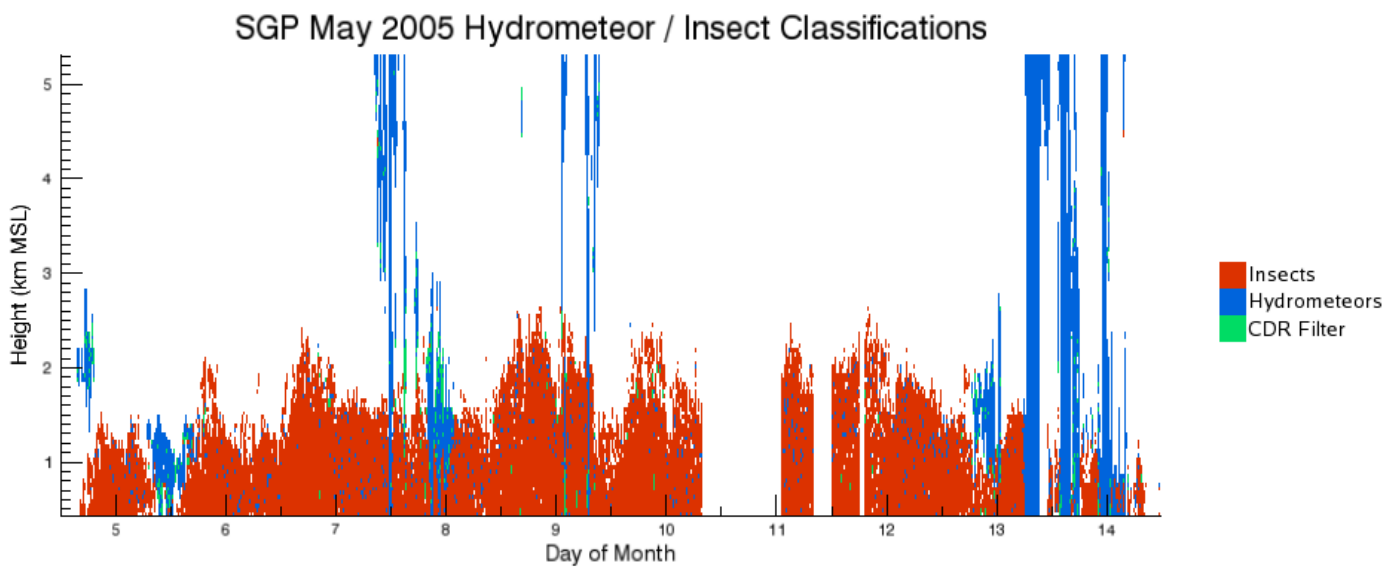

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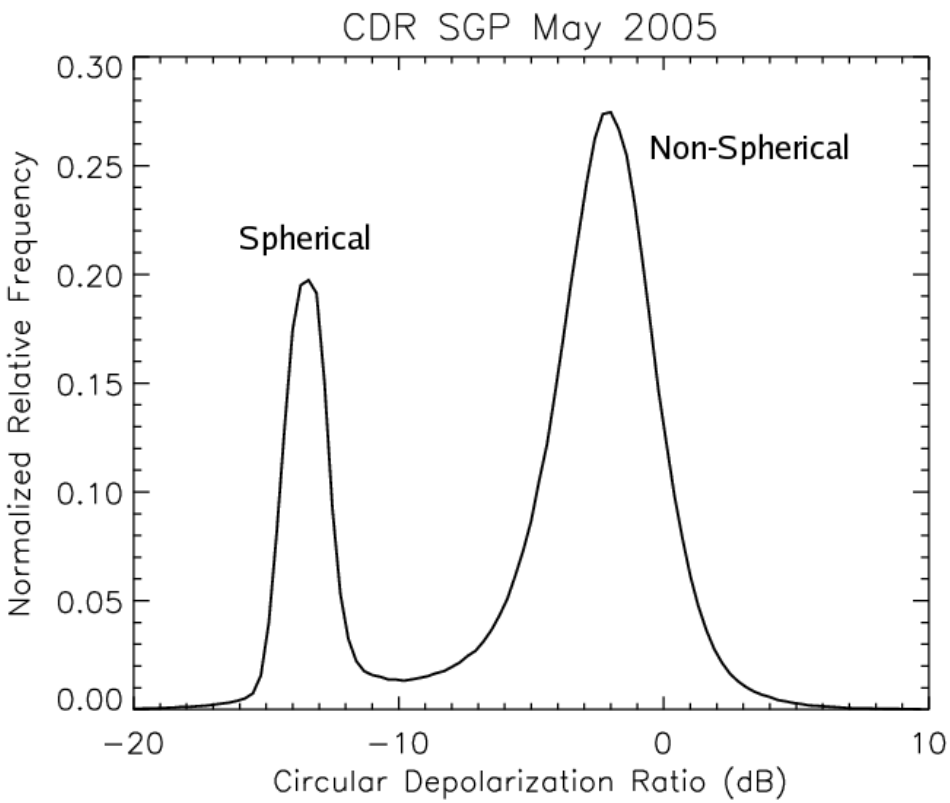
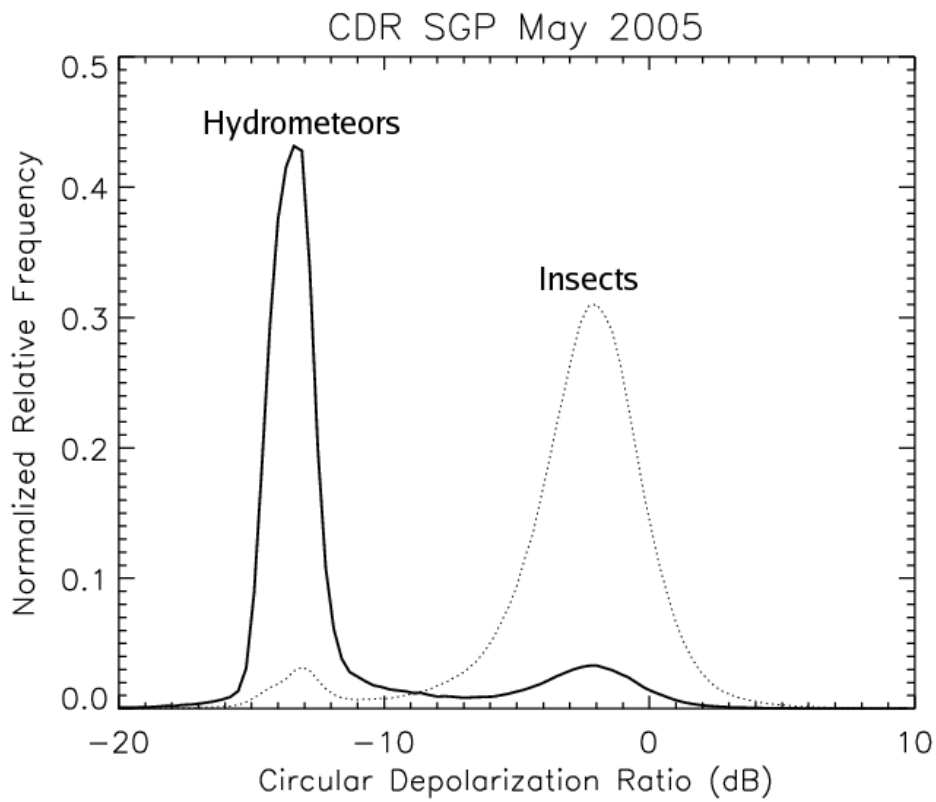
CDR Validation of Insect Clutter Mask





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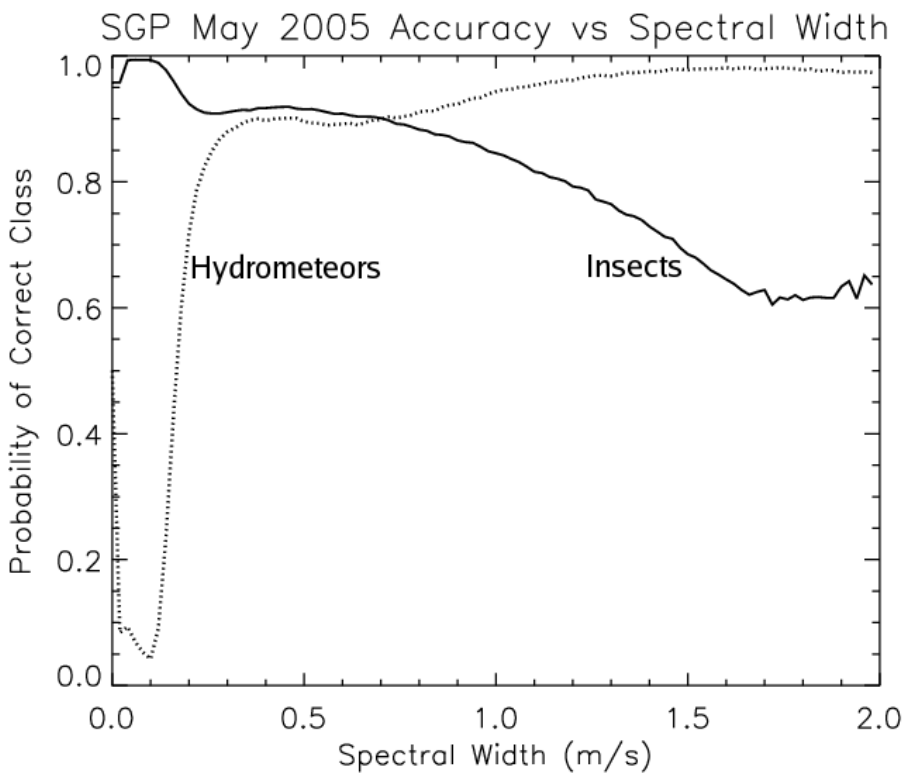
Insect Detection Success Rate based on CDR



Classification Success/Fail Rates		
	Classified as hydrometeors	Classified as insects
CDR < -10.5	86.8%	13.2%
CDR >= -10.5	7.3%	92.7%

A manuscript describing these results is ready for submission to the Journal of Oceanic and Atmospheric Technology: A Technique for the Automatic Detection and Removal of Insect Clutter in Cloud Radar Returns, E. Luke, P. Kollias, K. Johnson, E. Clothiaux.

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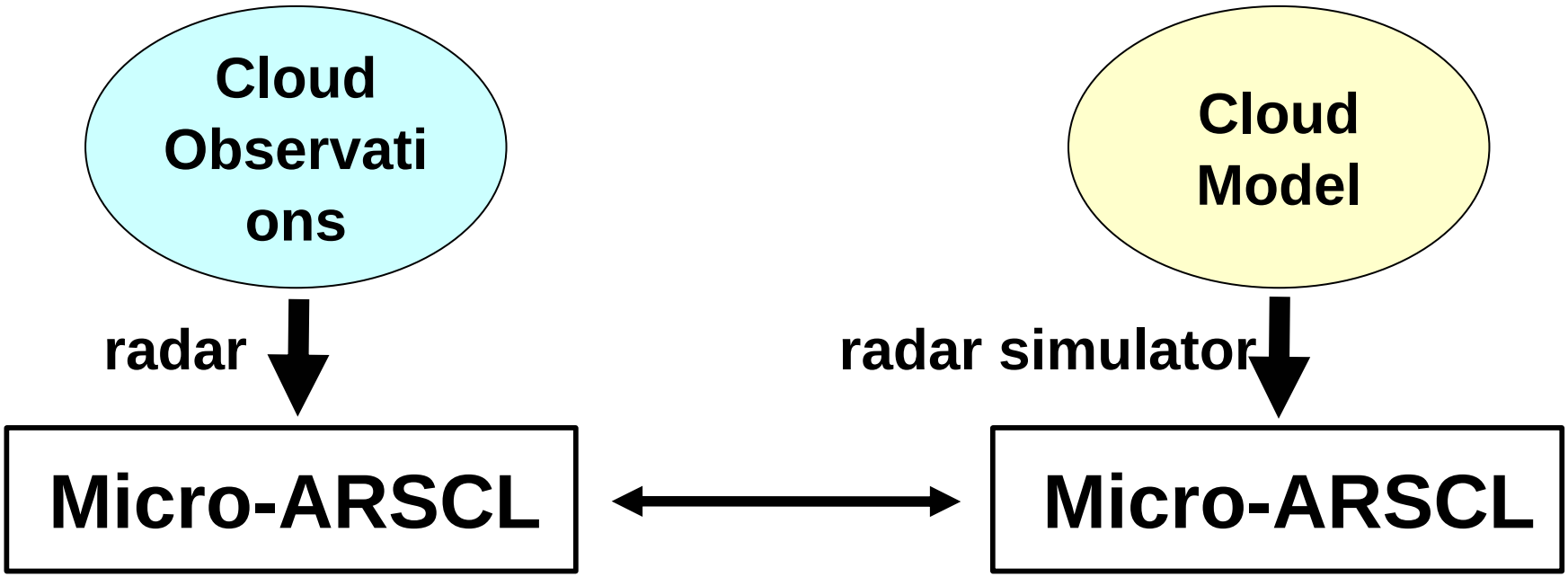
Micro-ARSCL output from LES cloud models via Doppler radar simulator would enable direct inter-comparison with radar observations on the basis of a rich set of microphysical parameters.



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