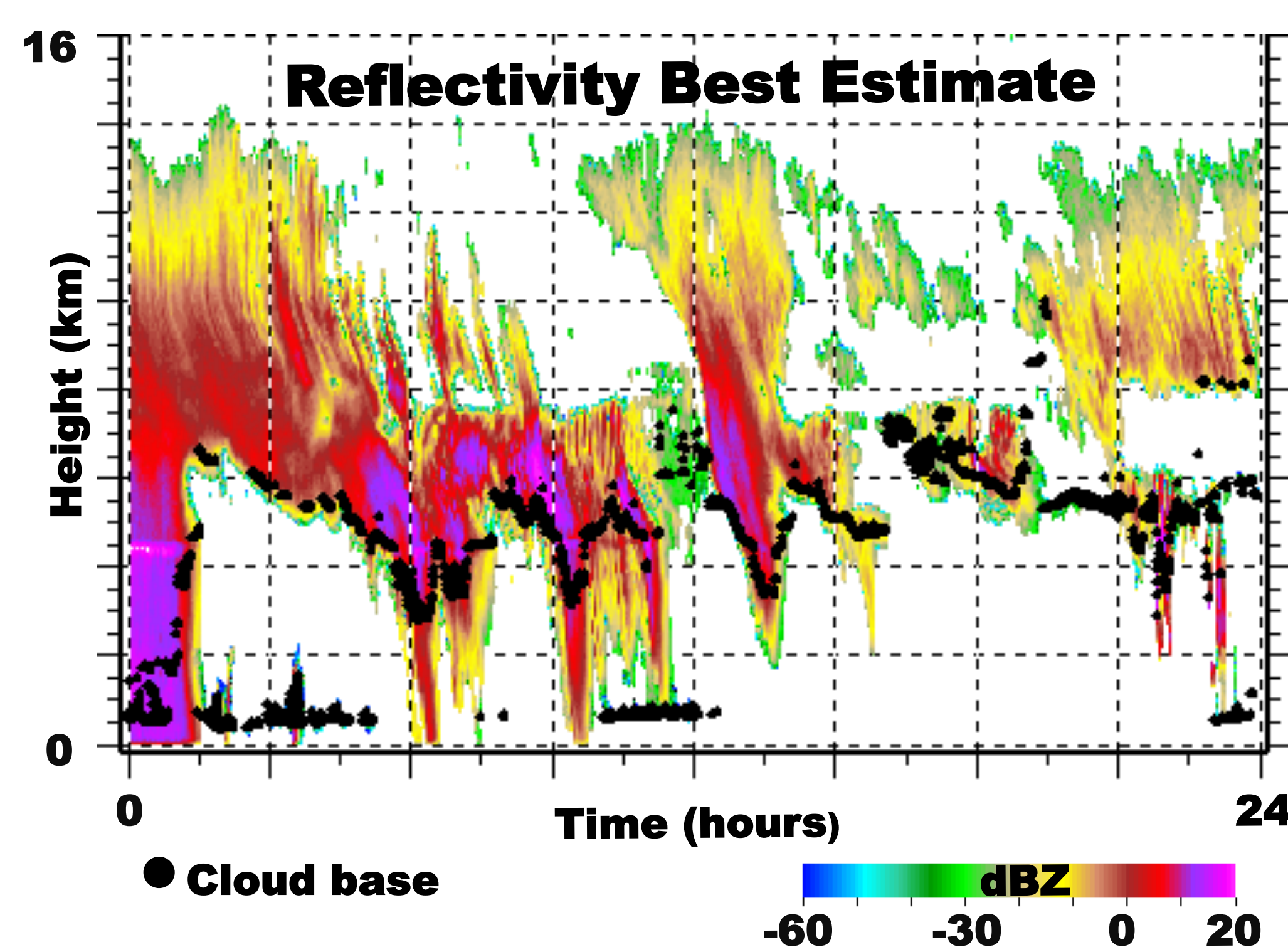


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1. What is ARSCL?

ARSCL is the **Active Remote Sensing of Clouds Value-Added Product (VAP)**. It combines information from several fundamental active cloud sensors: the zenith-pointing cloud radar, micropulse lidar and ceilometer. ARSCL converts instrument data into meaningful fundamental cloud properties: cloud boundaries and hydrometeor reflectivities, vertical velocities and spectrum widths.



2. What is Changing?

ARM is bringing online new ARRA-funded zenith-pointing and scanning cloud radars. To accommodate and leverage the capabilities of the new radars, we plan to:

- Develop new profiling ARSCL VAP
- Upgrade Micro-ARSCL
- Develop ARSCL Product in 3-Dimensions



ARM'S Millimeter Cloud Radars (MMCR's) are being extensively upgraded to become dual polarization **Ka-band ARM Zenith-pointing Radars (KAZRs)** with improved sensitivity and fewer artifacts.

Also being installed are **Scanning ARM Cloud Radars, SACRs**, which are dual-frequency and polarization diverse. They will provide routine 3-dimensional views of cloud fields.

3. Next-Generation ARSCL

The new version of the traditional time-height ARSCL will accommodate and merge the **KAZR data collection modes** and incorporate data from the new micropulse lidar cloud mask VAP, ceilometer, disdrometer, and soundings.

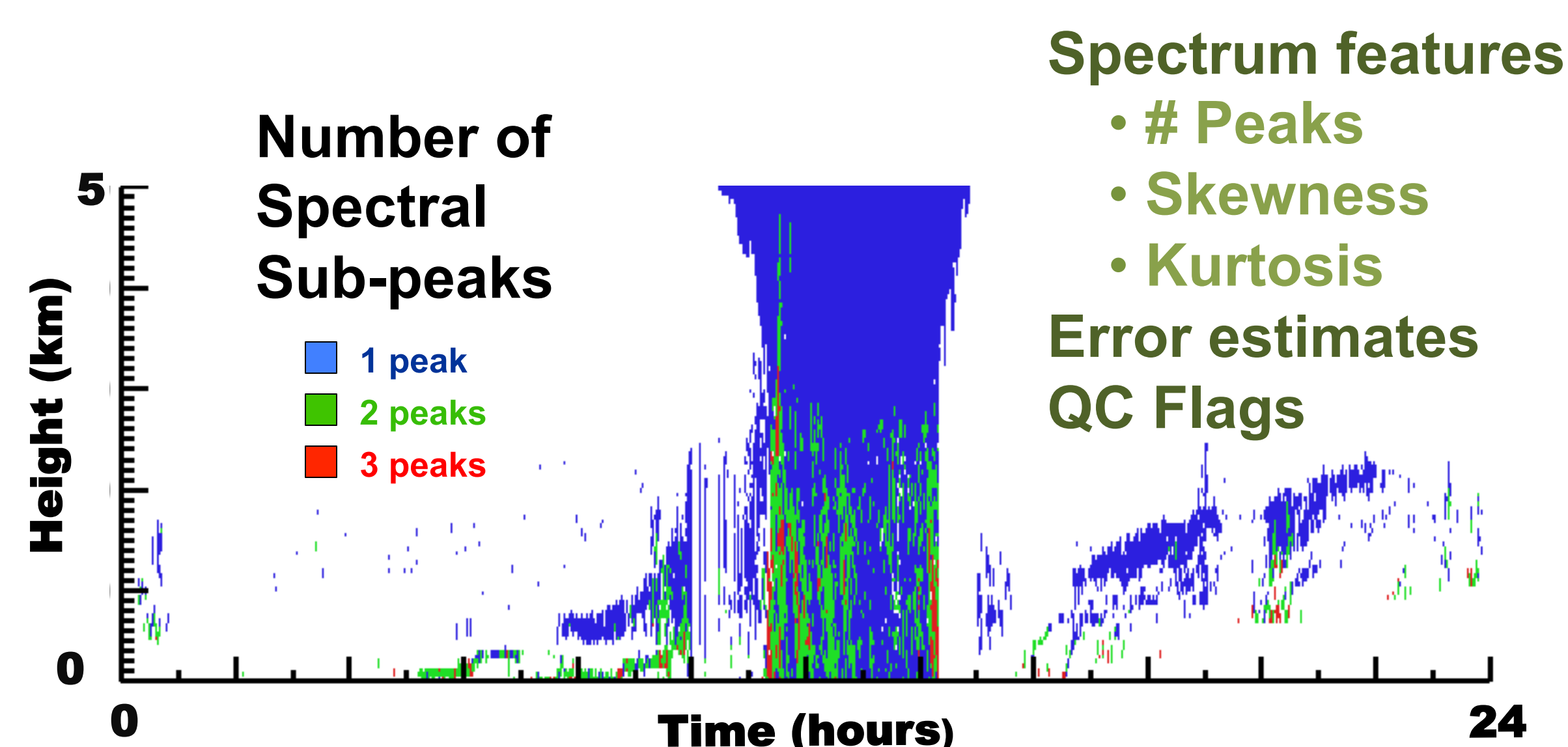
The new VAP will also address known **ARSCL limitations**, improving insect removal and velocity unfolding, for example, and reducing the processing resources required.

Profiling ARSCL: Next-Generation vs. Current

Feature	New ARSCL	Current ARSCL
Time Resolution	~ 4 s	10 s
Height Resolution	~ 30 m	~45 m
Insect Detection	Depolarization-Based	Partially 'by hand'
Radar Artifacts	Less intrusive	Significant
Vapor Attenuation	Corrected	--
Velocity Folding	Corrected	Partial
Processing Paradigm	Hands-off	Manual QC
Processing Location	DMF or BDS	BNL
Lag Time	~ 2 months	Considerable

4. Micro-ARSCL

Micro-ARSCL, which provides Doppler spectra features such as number of spectral peaks and skewness, will be upgraded for KAZR. The new product will match ARSCL in time and height, processing the "best mode" spectrum. This allows a **seamless transition from ARSCL moments to spectra features** to support development of the next generation of microphysical products.



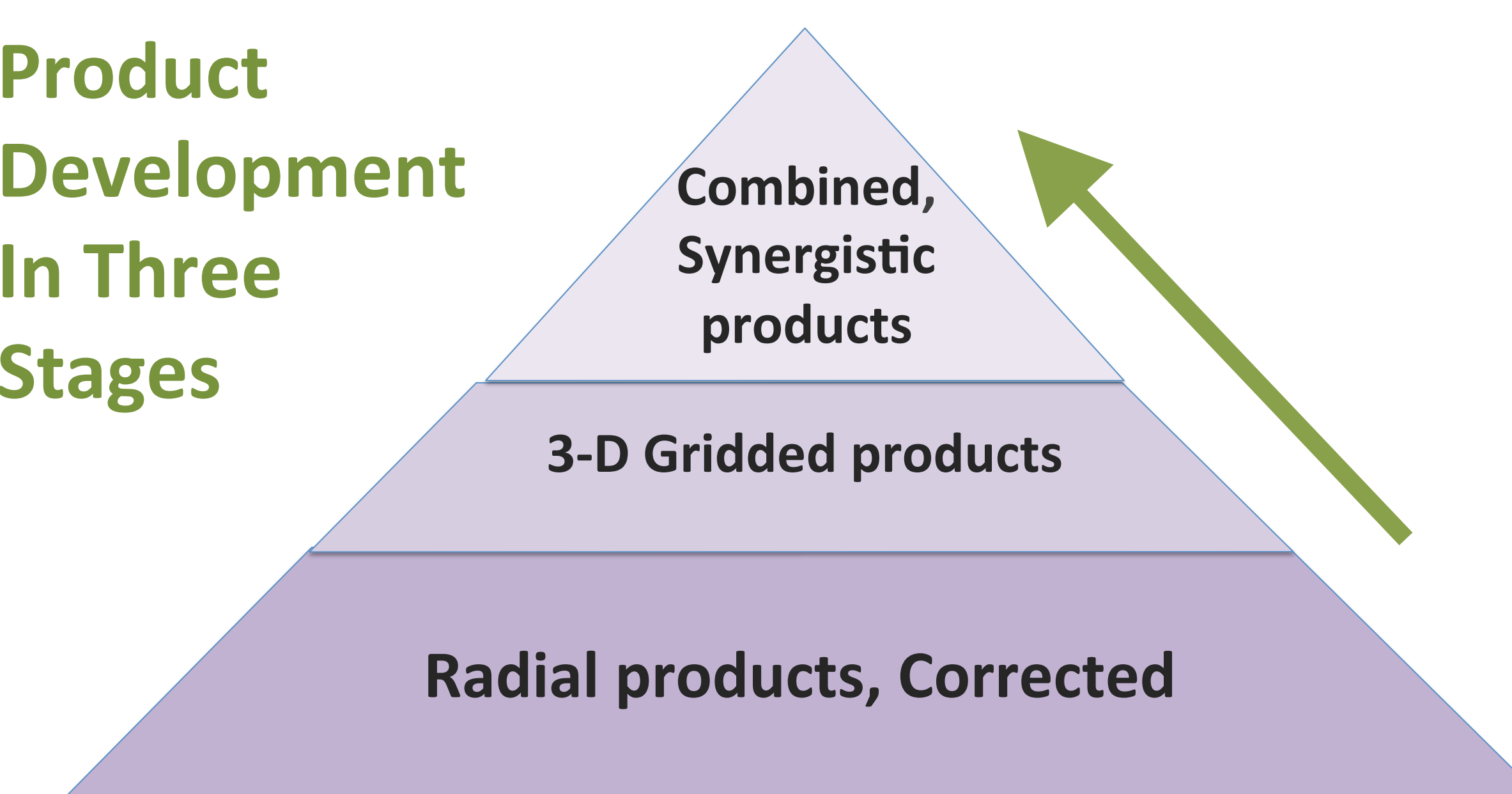
Summary

The ARSCL suite of products will be upgraded and expanded to leverage ARM's ARRA-funded profiling and scanning cloud radars. A new version of the traditional profiling ARSCL product will be developed and the spectra-based Micro-ARSCL product will be upgraded. ARM's cloud product offerings will be extended into three dimensions at four fixed and two mobile sites with the development of the new 3D-ARSCL.

5. ARSCL 3-D

The 3-D ARSCL product will handle data from the scanning SACR radars. Initially, separate products will be developed for each of the platform's two frequency-diverse radars. Longer term plans include development of dual-frequency synergistic products.

Product Development In Three Stages



Development plan for 3-D ARSCL.

In the first stage of development, a significant detection mask will be created from the radial moments. Moments will then be corrected for range and velocity folding and water vapor attenuation. Finally, the corrected moments will be gridded. **Please see the poster by Kollias et al. for further discussion of the challenges involved and proposed solutions.**

References

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