

# ARM Scanning Radar Azores Graciosa Deployment

# Cloud Climatology for Azores

AMF Site: Graciosa Island  
in the Azores (28 °W 39 °N)

- Small Low Island
- No Direct Continental Influence
- MBL Depths 1-2 km



Avg Winds

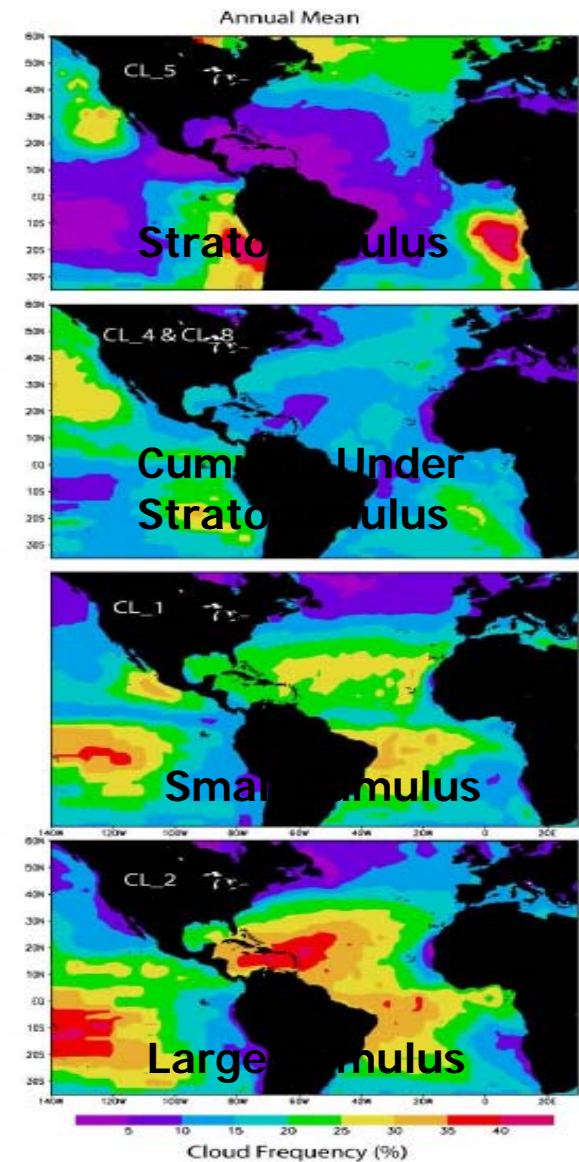


Figure 6: Annual mean frequency of occurrence of (from top) stratocumulus, stratocumulus with cumulus beneath or formed from spreading cumulus, small cumulus, and large cumulus

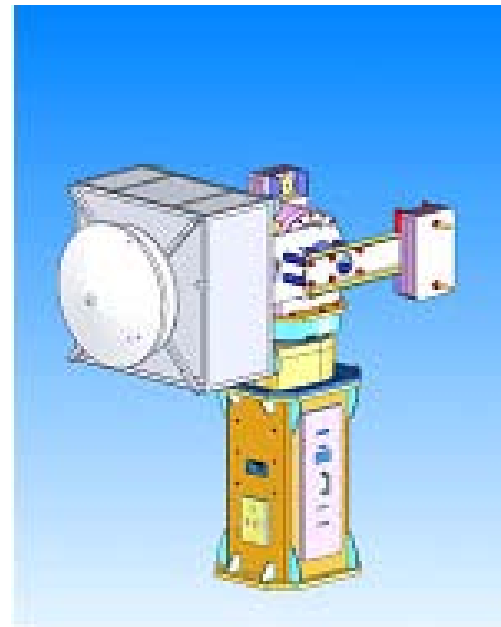
# Scanning W-band ARM Cloud Radar

Same radar frequency as NASA's CloudSat

Capable of detecting all radiatively significant clouds in a radius of 5-10\* km

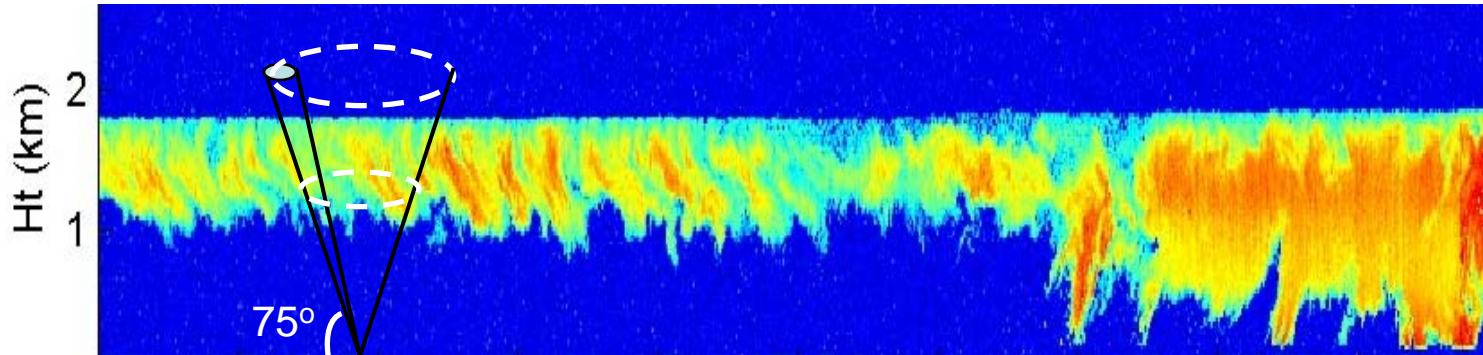
Scanning capabilities:

1. Horizon to Horizon (fixed azimuth)
2. 360° revolution (fixed elevation)
3. Sector scan (for cloud tracking)
4. Staring mode

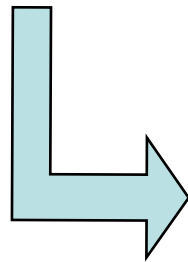


# 3D-Cloud Products

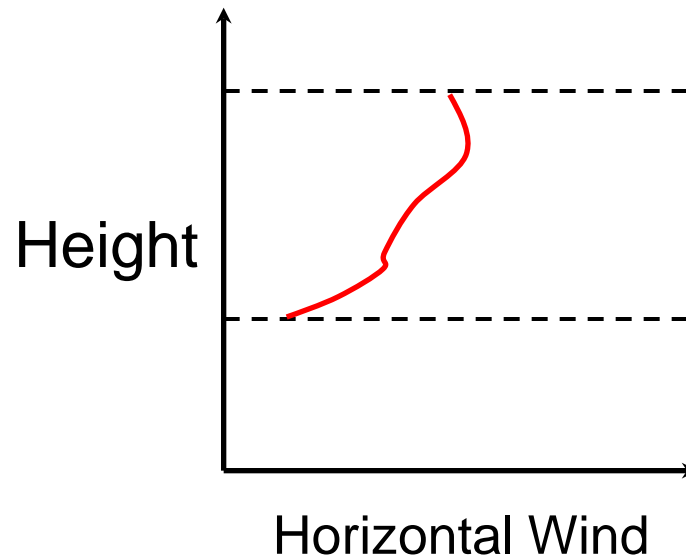
## Case Study - Marine Stratocumulus



VAD (EVAD/CEVAD)

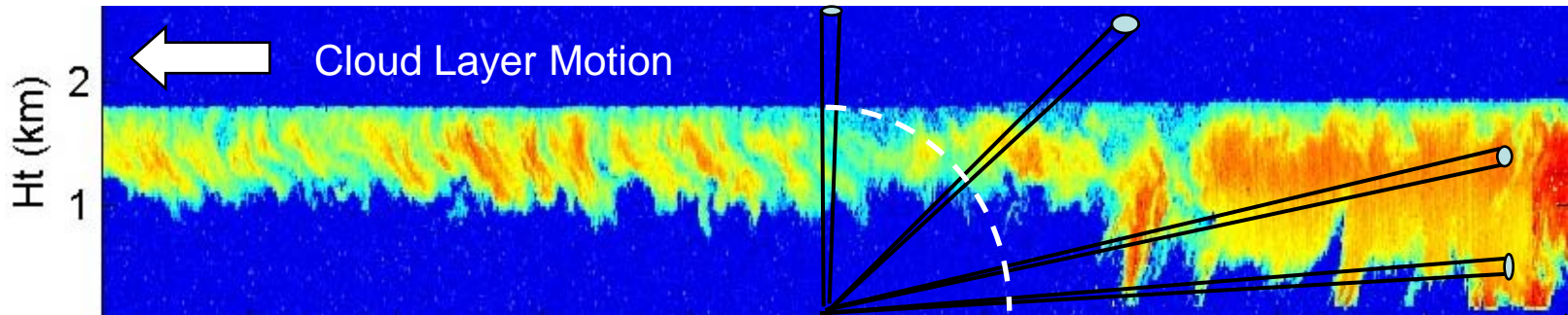


In-cloud horizontal wind  
and divergence



# 3D-Cloud Products

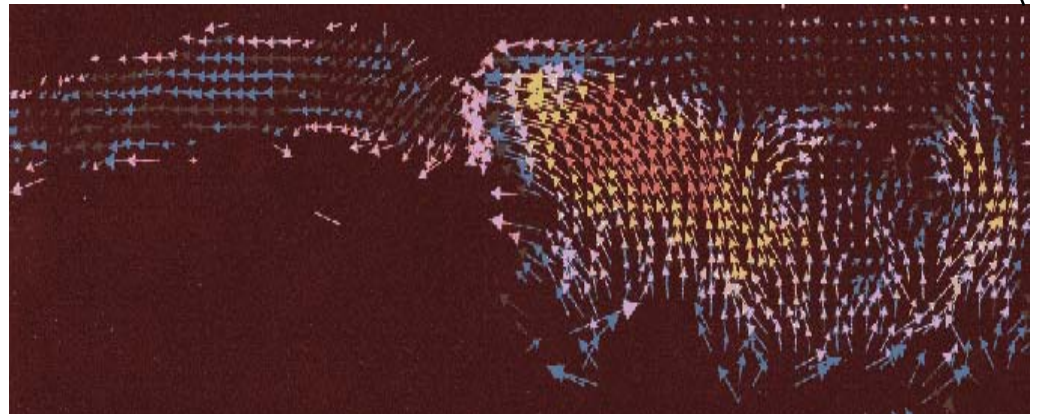
## Case Study - Marine BL Clouds



Scan into the direction the cloud layer comes from

Follow the lifecycle of cloud elements

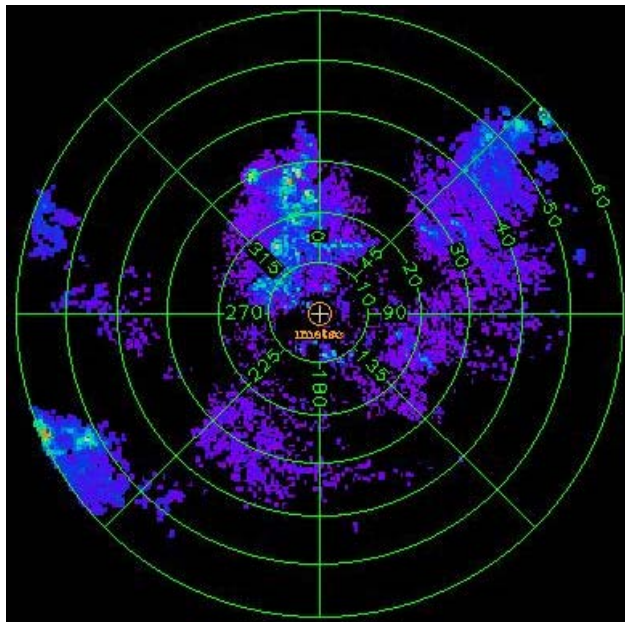
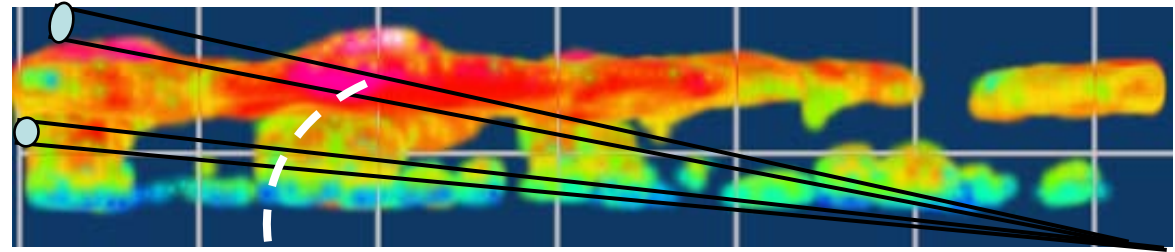
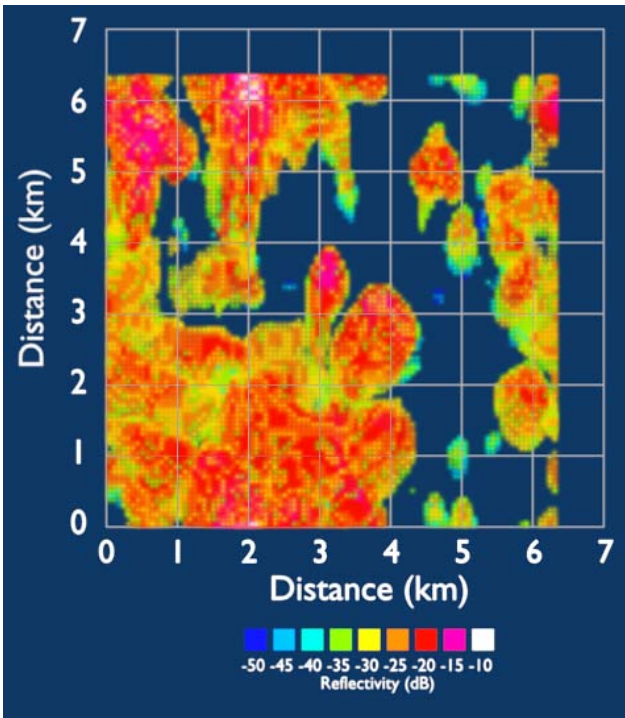
Retrieve the 2D kinematic structure of the cloud





# 3D-Cloud Products

## Case Study - Marine BL clouds

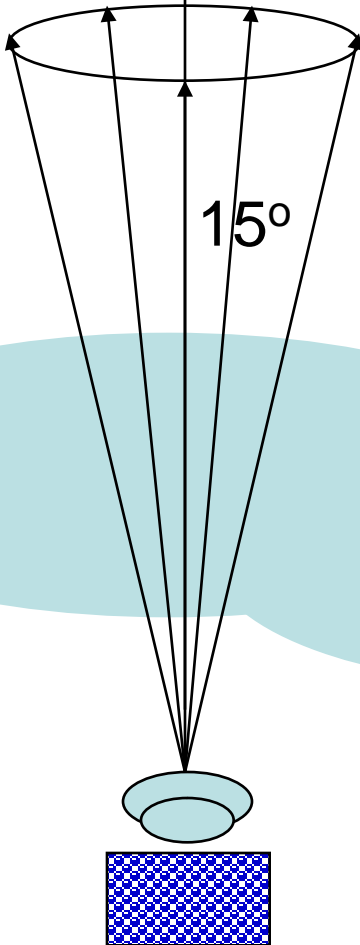


Low Elevation 360° revolution

Product: 3D cloud fraction

# Strawman Scan Strategy/Sequence

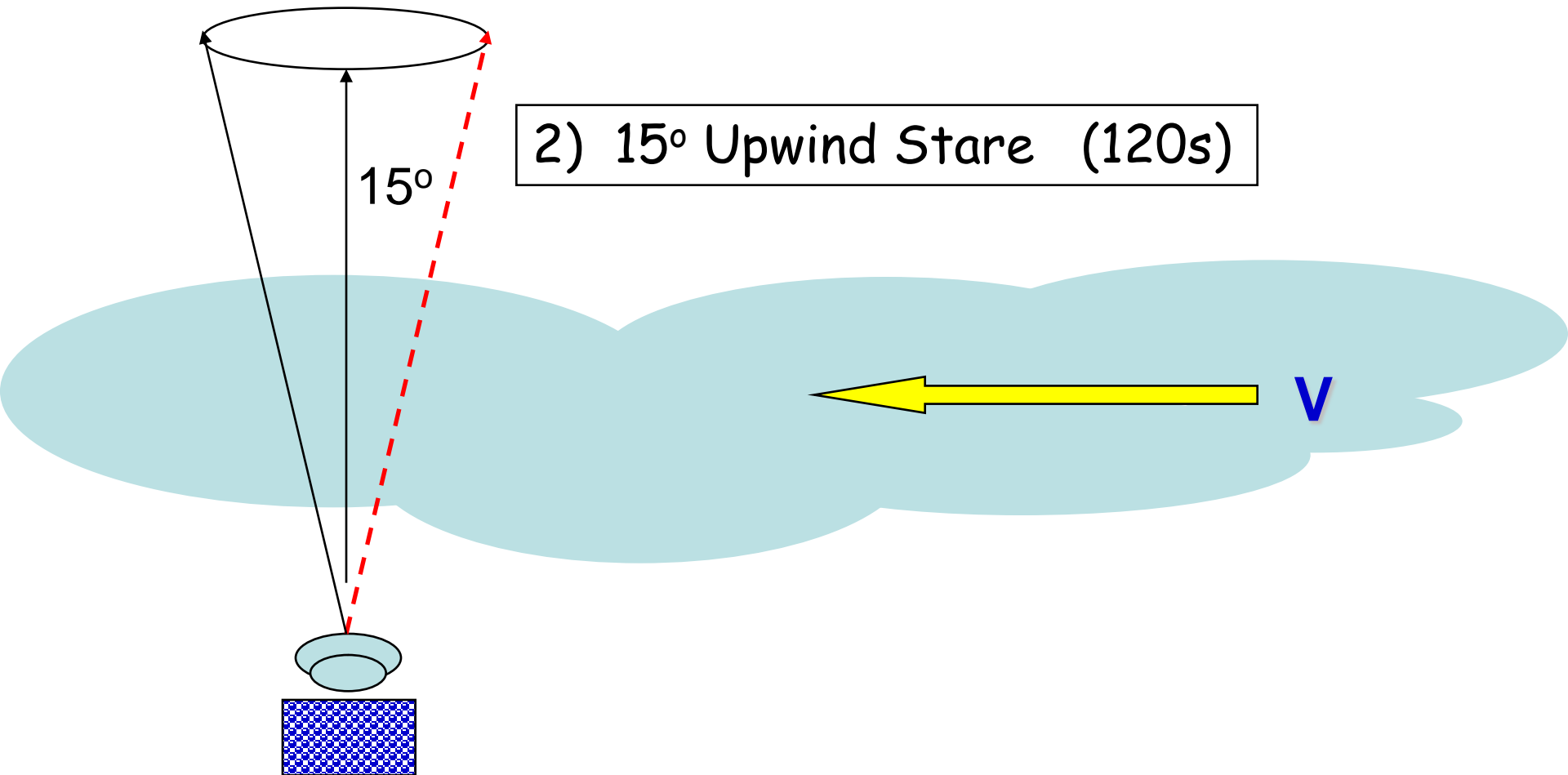
1) VAD (20 s)



# Strawman Scan Strategy/Sequence (1)

1) VAD (20 s)

2) 15° Upwind Stare (120s)



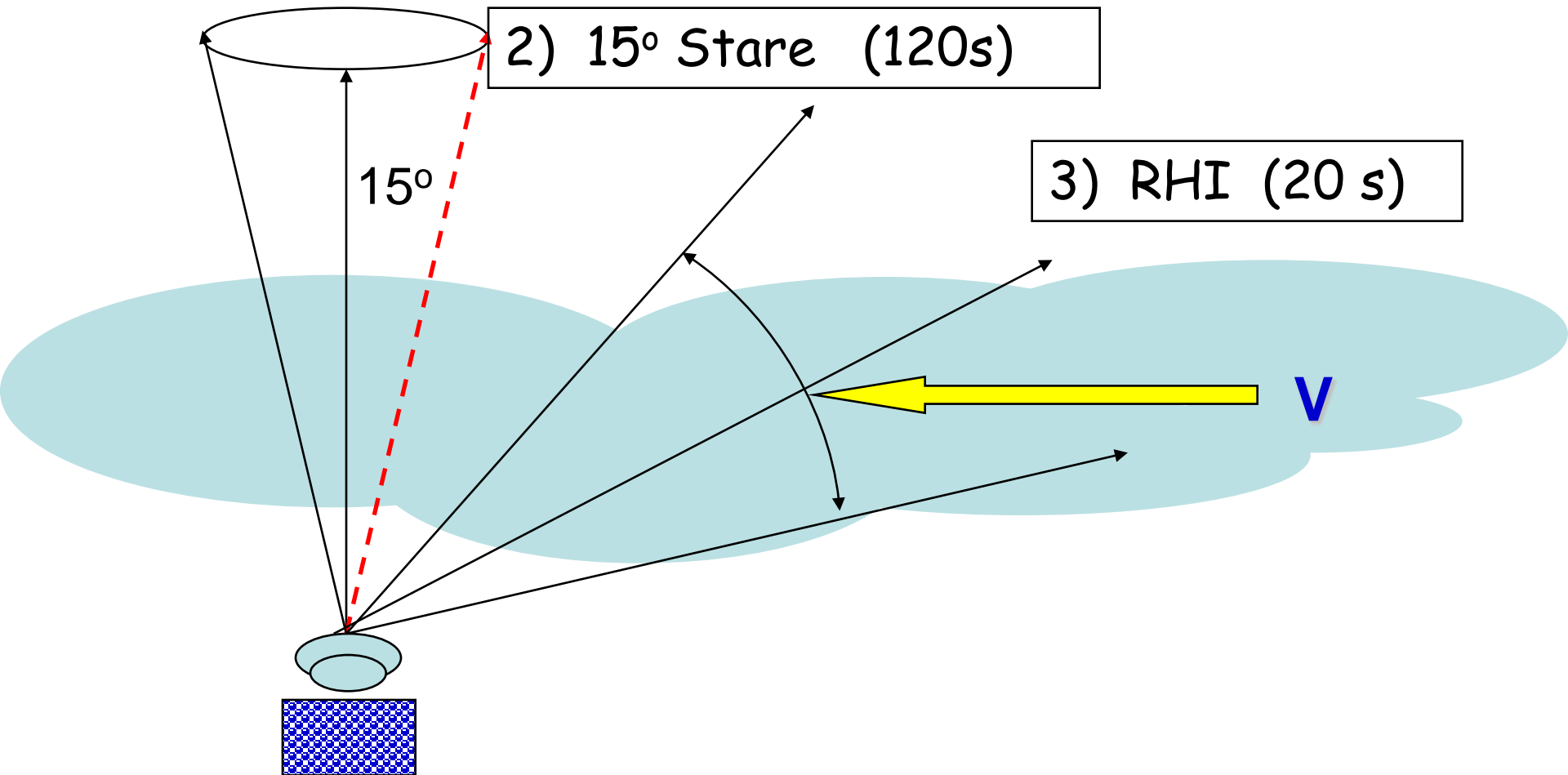


# Strawman Scan Strategy/Sequence (1)

1) VAD (20 s)

2) 15° Stare (120s)

3) RHI (20 s)



# Strawman Scan Strategy/Sequence (1)

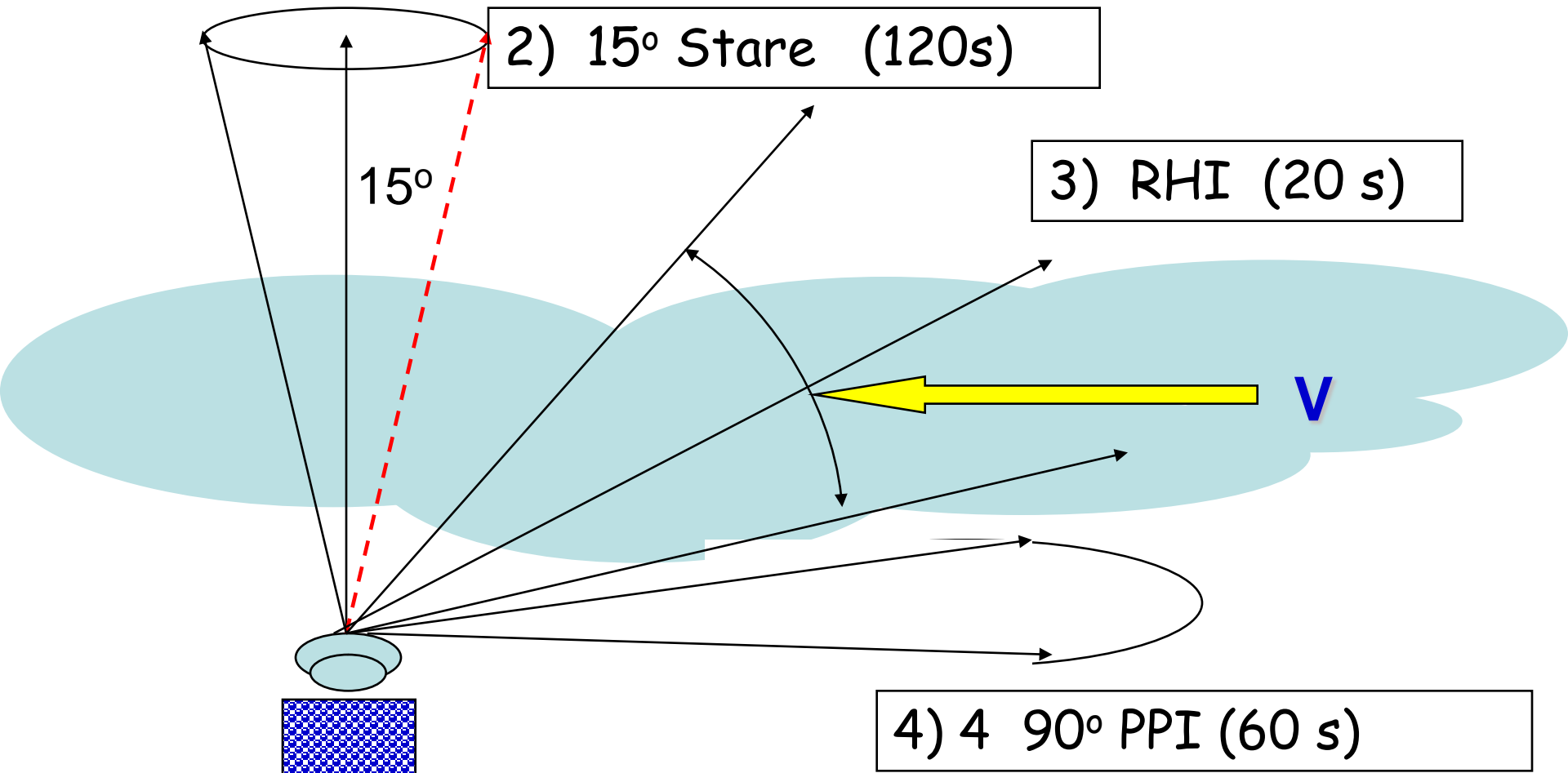
1) VAD (20 s)

Total 215 s

2) 15° Stare (120s)

3) RHI (20 s)

4) 4 90° PPI (60 s)



## Develop Scanning Strategies for Different Cloud Types(?)

- Stratocumulus (Drizzle)
- Cumulus under Stratocumulus (Drizzle)
- Small Cumulus (Drizzle)
- Large Cumulus (Precip)

Establish Procedure for Evaluating and Modifying Scanning Strategies