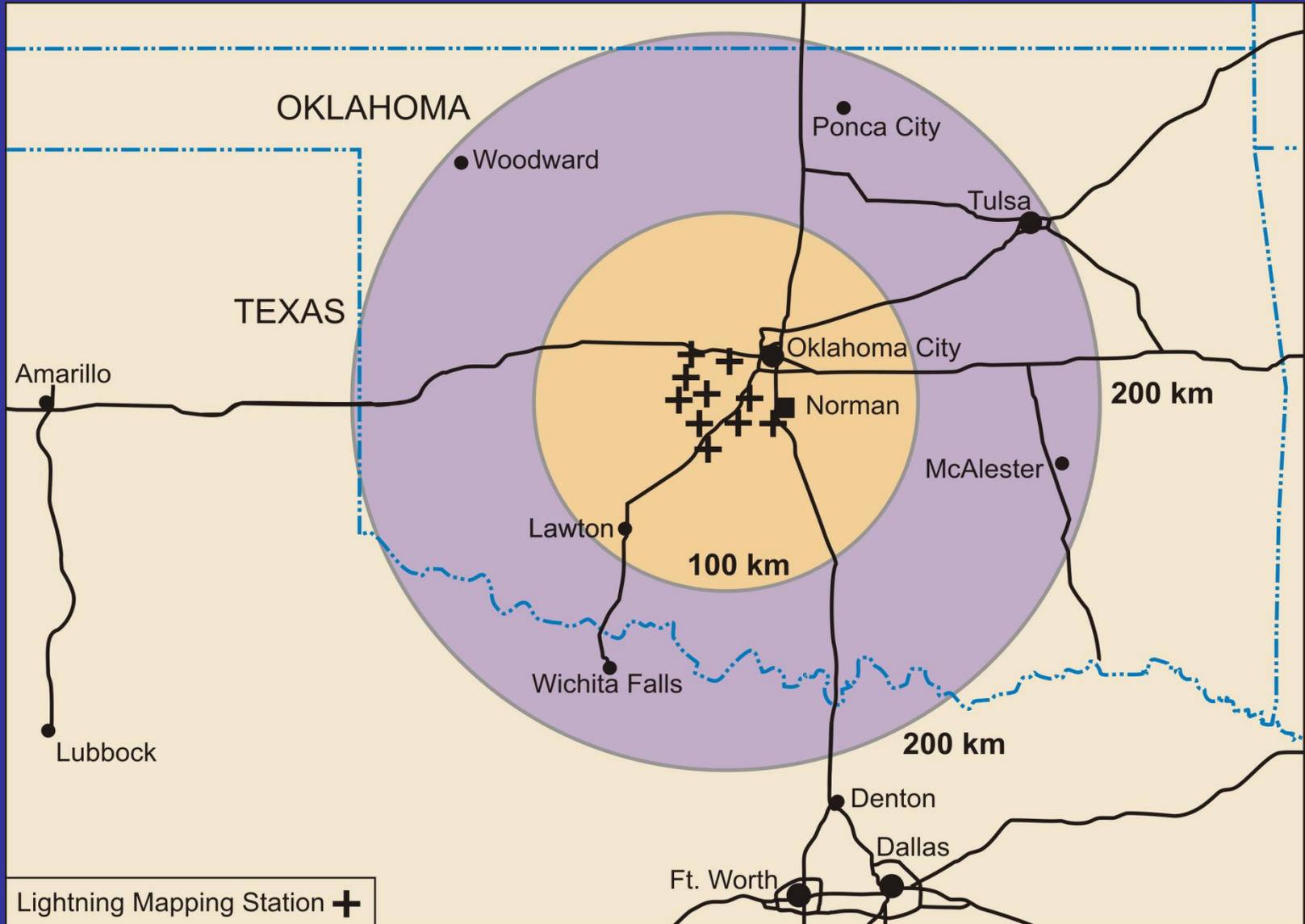
A dramatic night scene with a lightning bolt striking a building. The sky is dark blue, and the lightning bolt is bright yellow and white. The building is a multi-story structure with a tower, and there is a large, rounded structure in the foreground. The overall mood is intense and powerful.

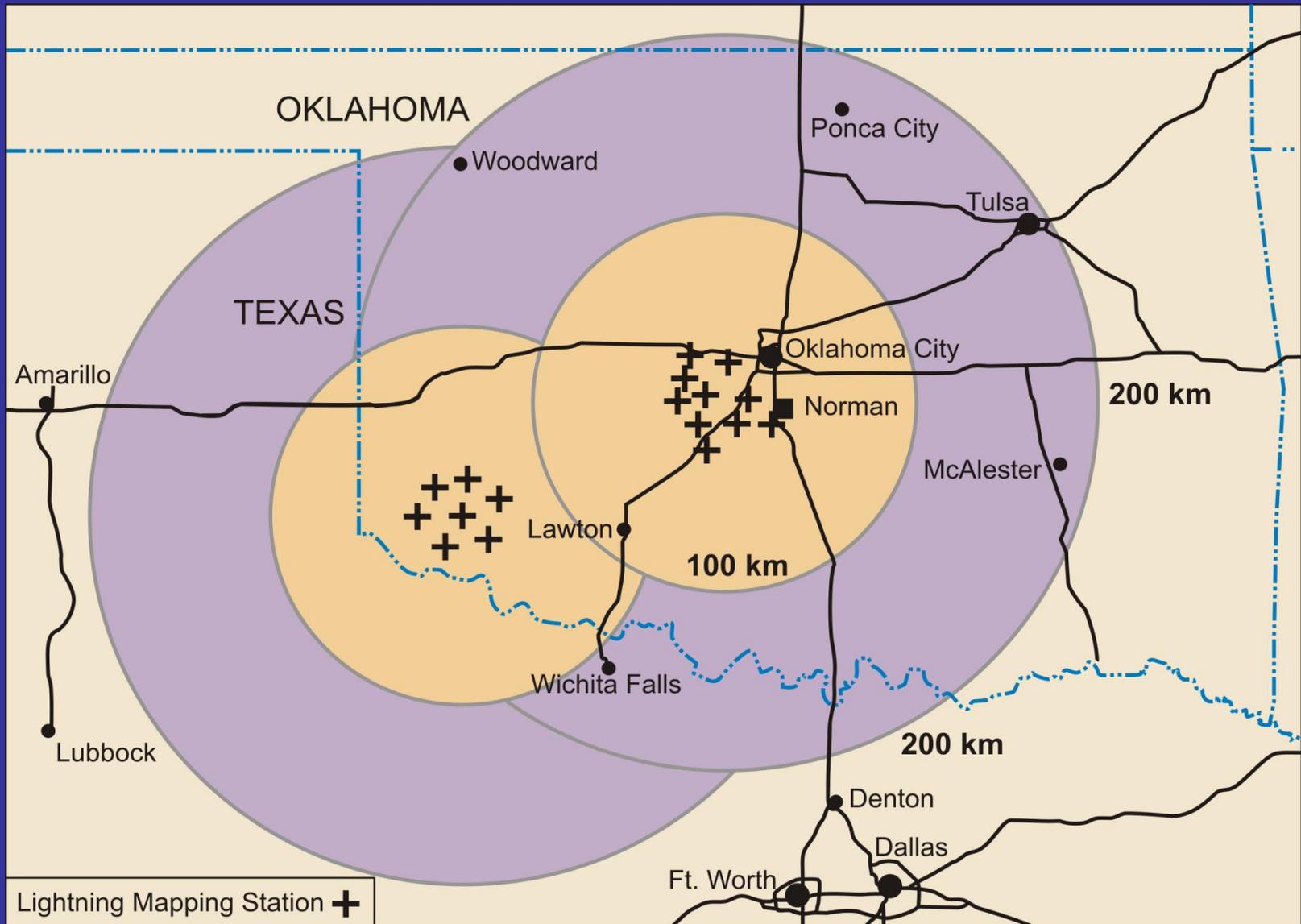
# **A Few Issues Concerning Nowcasting Applications Based on Oklahoma Lightning Mapping Array Data**

**Don MacGorman  
NOAA/National Severe Storms Laboratory  
CIMMS/University of Oklahoma and NOAA**

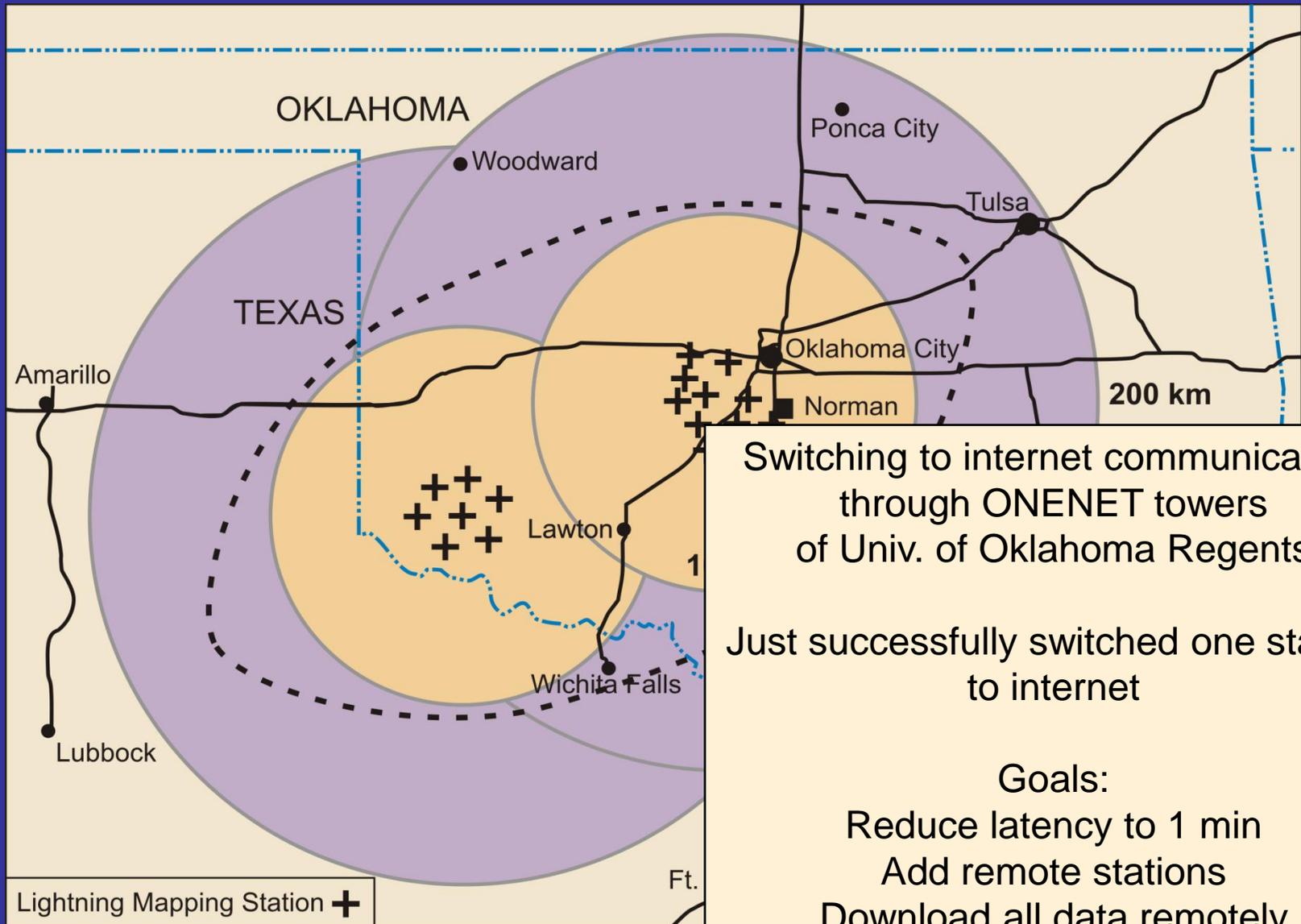
# Present OKLMA



# Planned Expansion



# Planned Expansion



Switching to internet communication through ONENET towers of Univ. of Oklahoma Regents

Just successfully switched one station to internet

Goals:

Reduce latency to 1 min

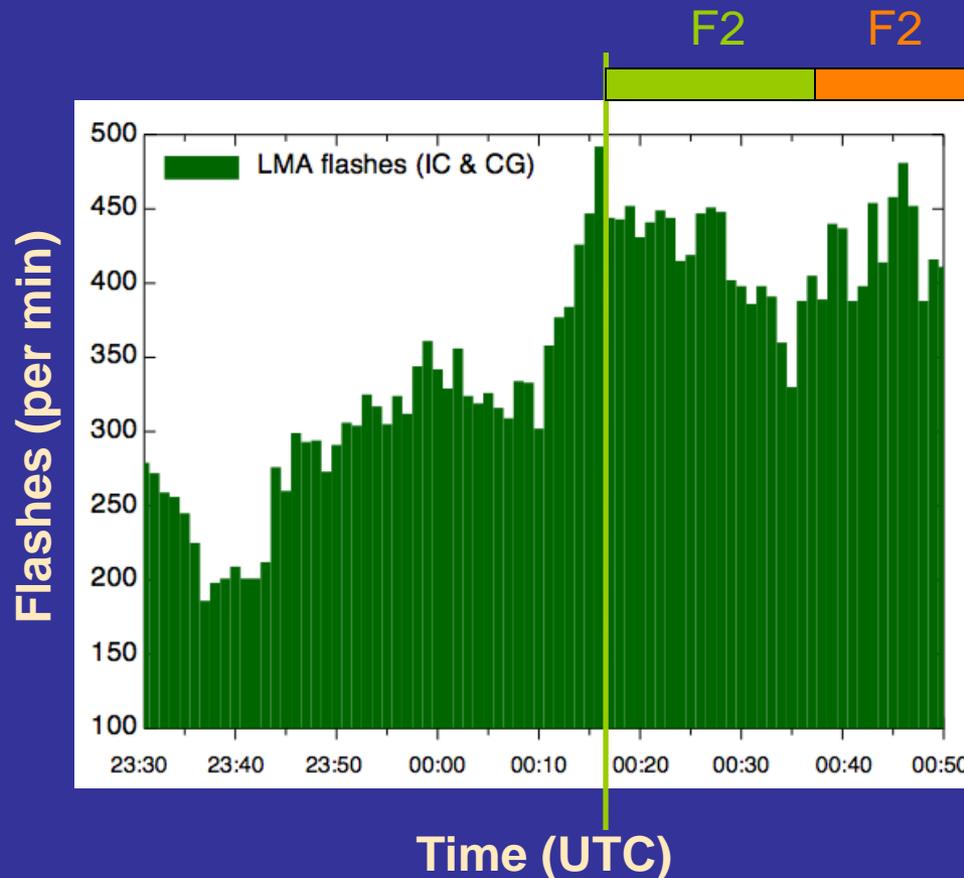
Add remote stations

Download all data remotely

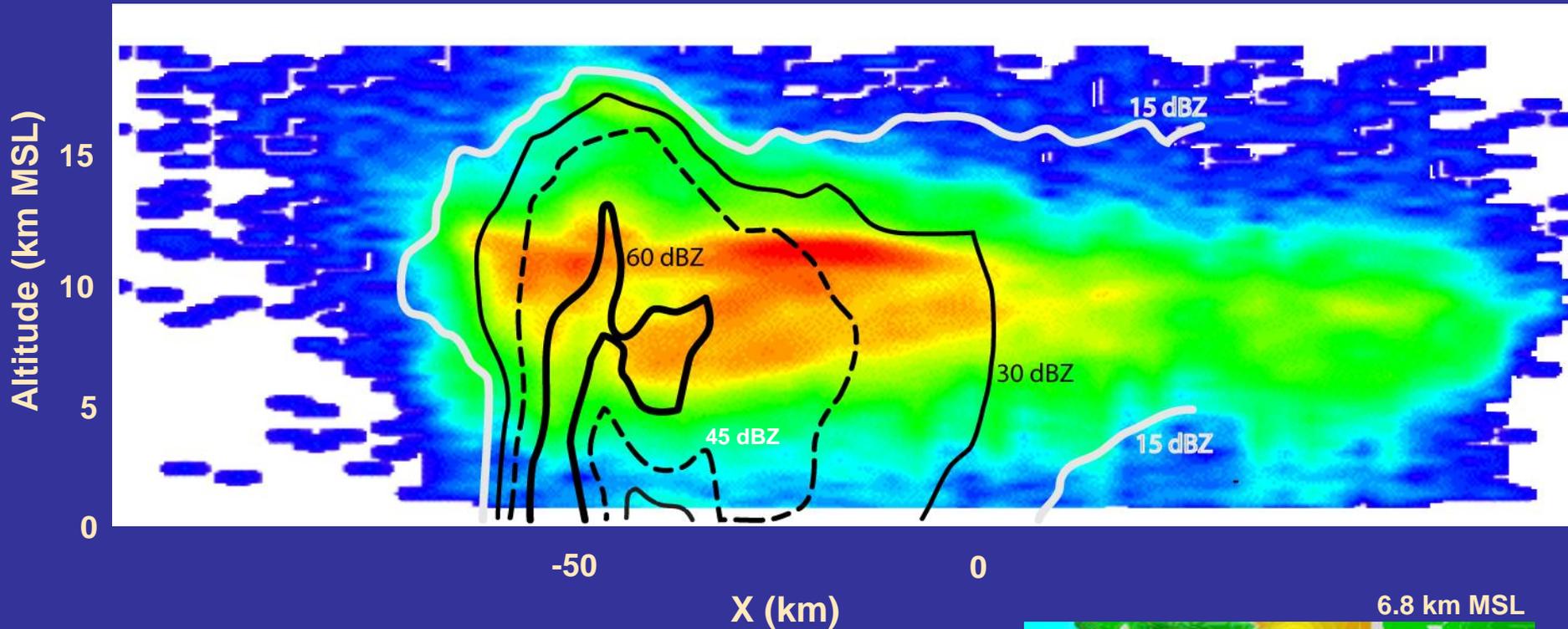
# 29-30 May 2004

## Flash Rates

- Sudden jump in flash rates just before first F-2 tornado
- Estimated peak flash rate of 8/second

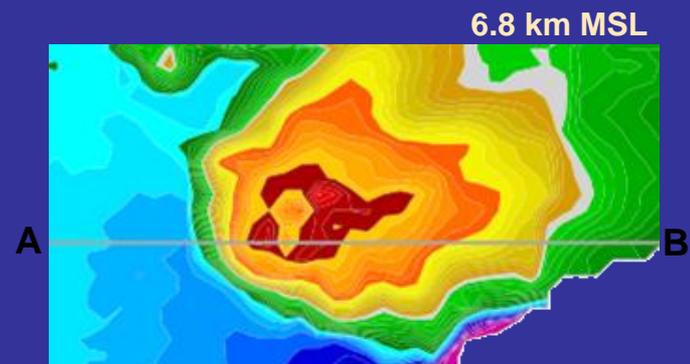


# Reflectivity and LMA Event Density

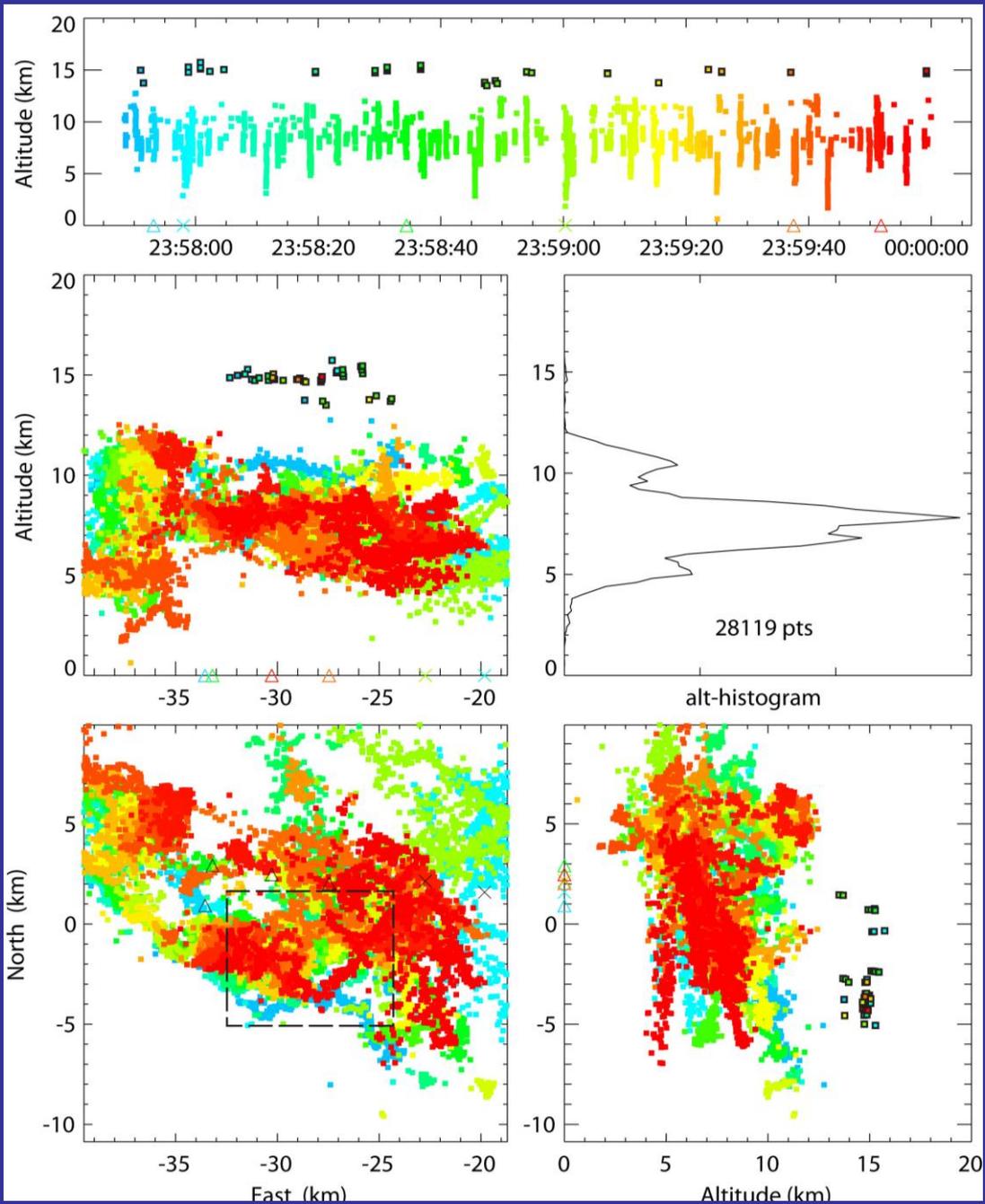


Radar: 0016:45 – 0018:32 UTC

LMA Data: 0015 – 0020 UTC



**24 May 2004**  
**23:58 UTC**  
**2.2 minutes**

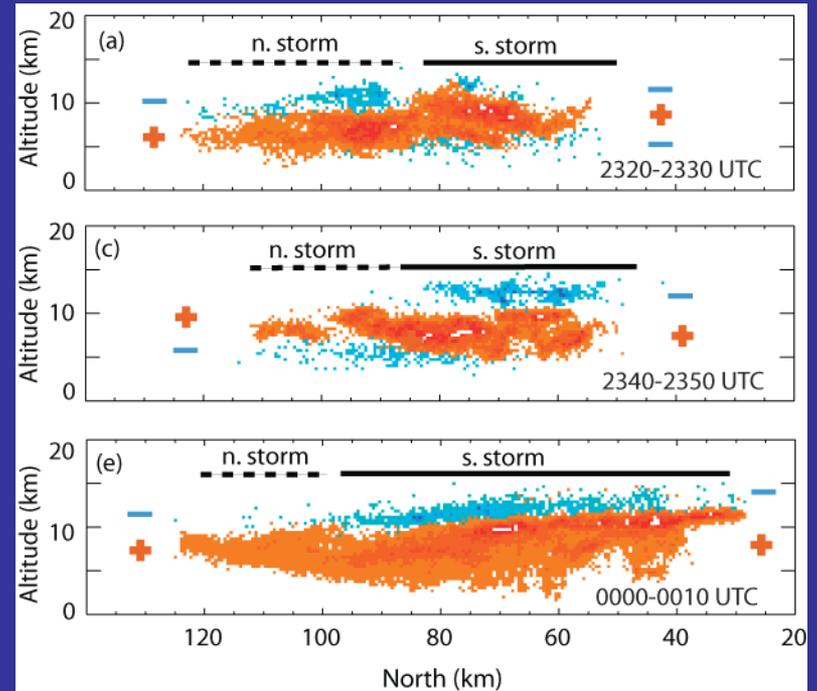
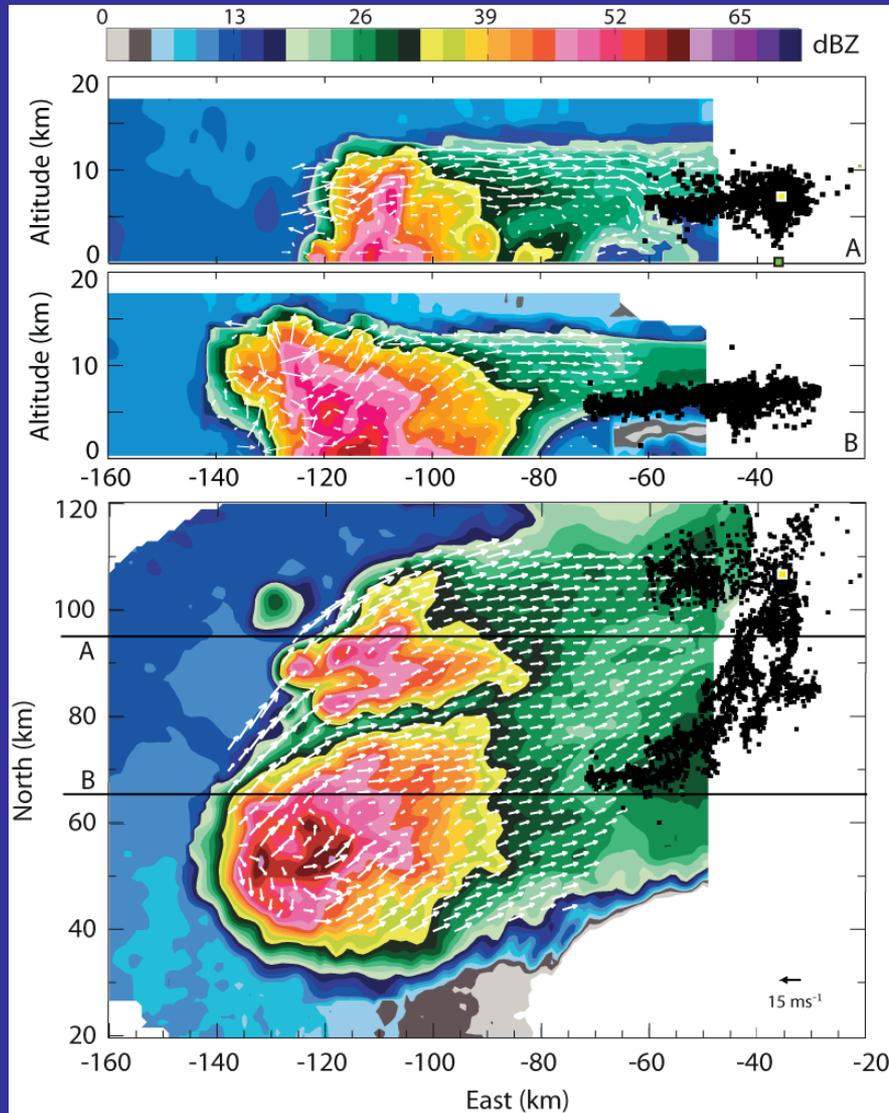


# Preliminary Findings

- Lightning in overshooting top of all warm-season supercells checked thus far
- Lightning not in overshooting top of much shallower February supercell

# Anvil Flash

29 May 2004, 2321:45 UTC

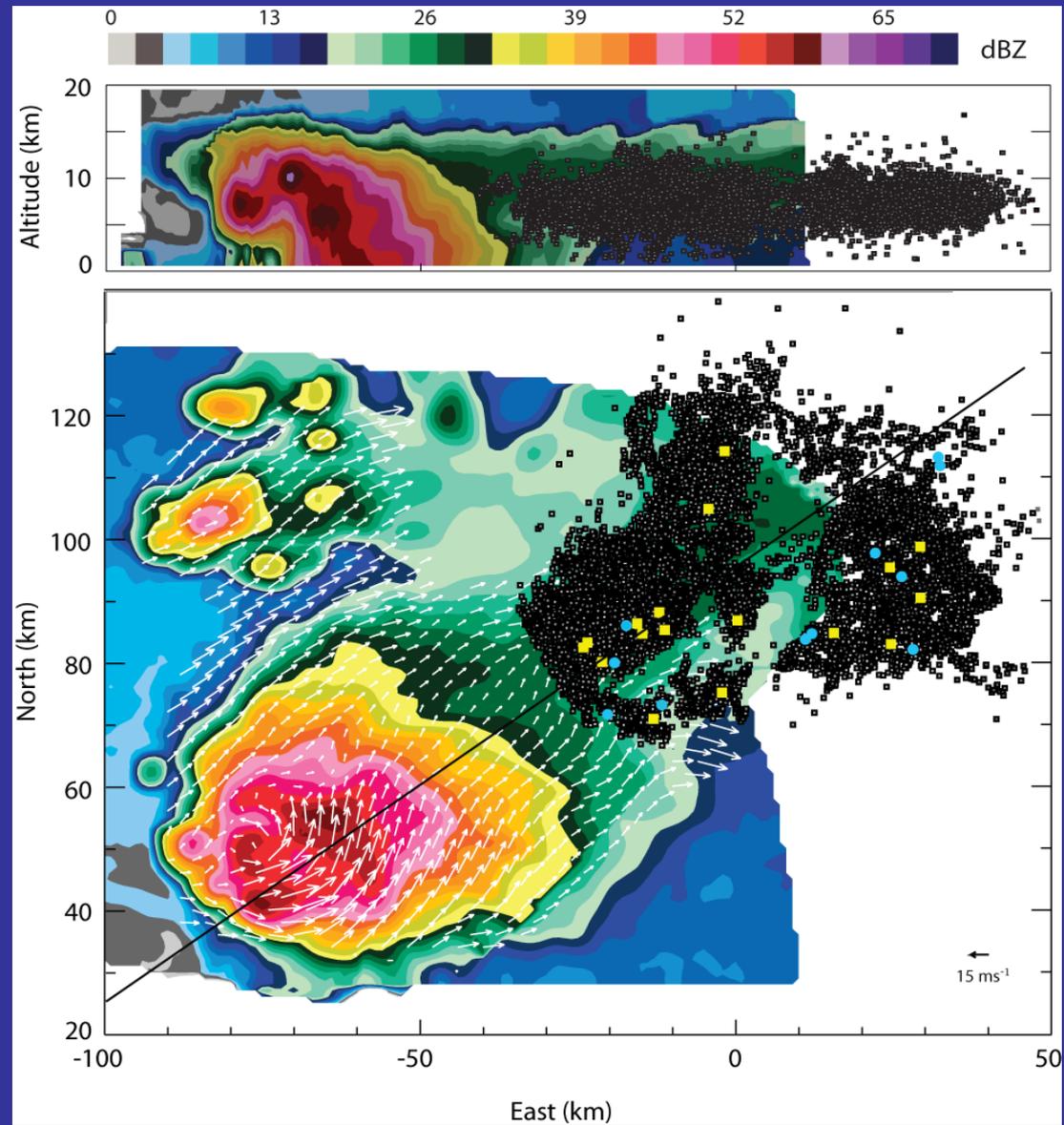


# Anvil-Initiated Flashes 5/30/04

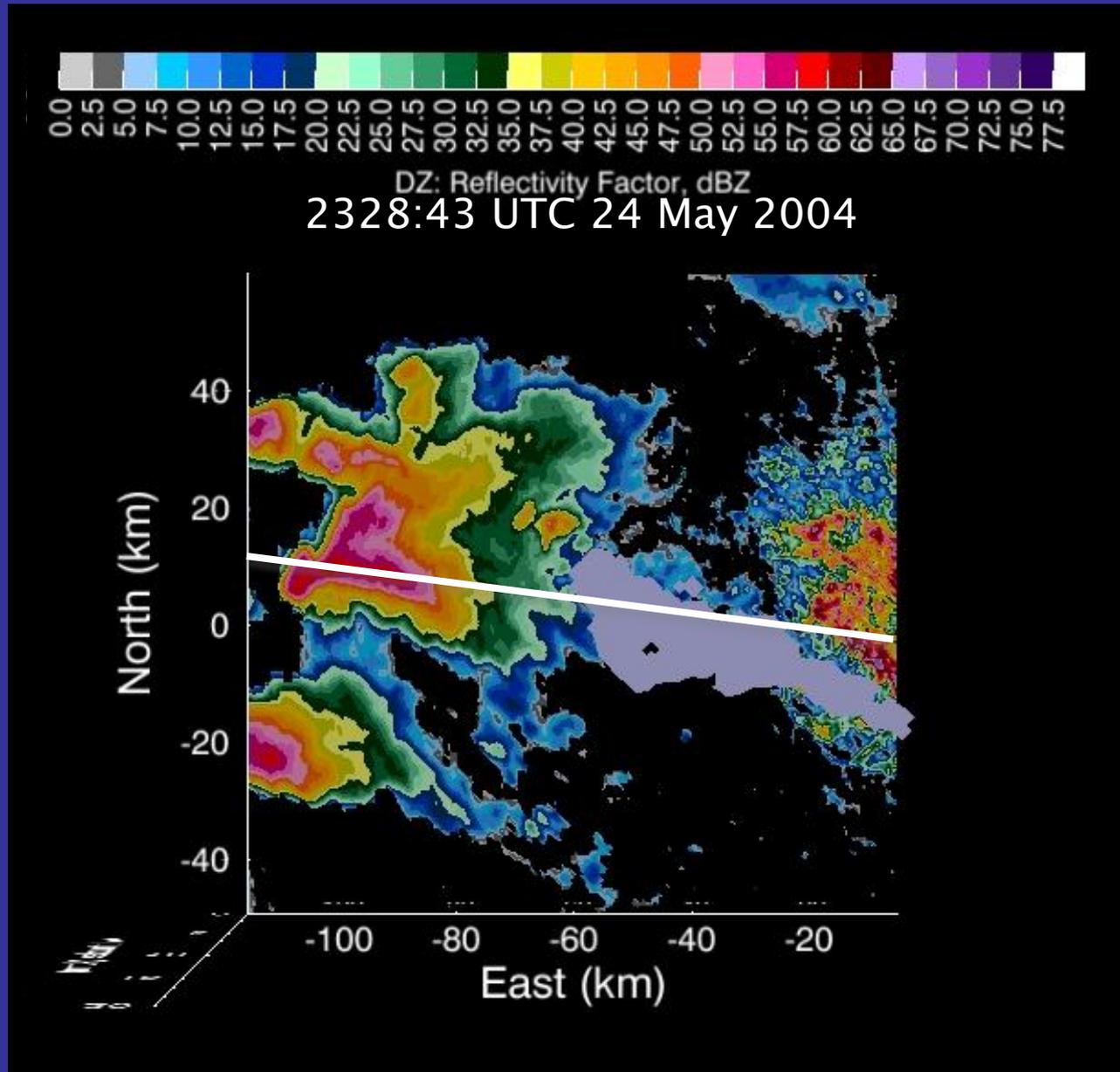
LMA data  
0030:30-0032:30 UTC

Radar data  
0038-0043 UTC

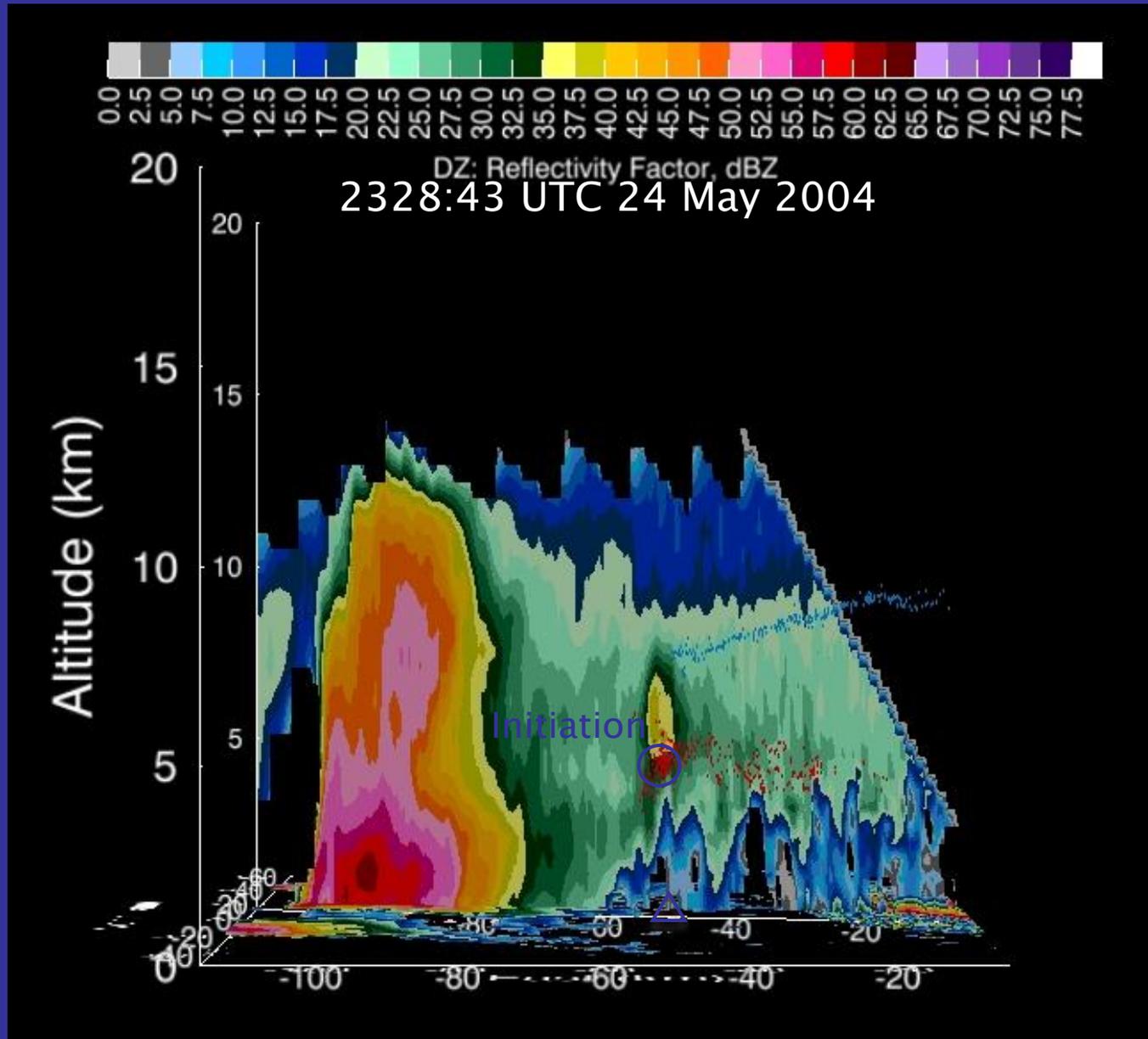
8 flashes / min  
in anvil



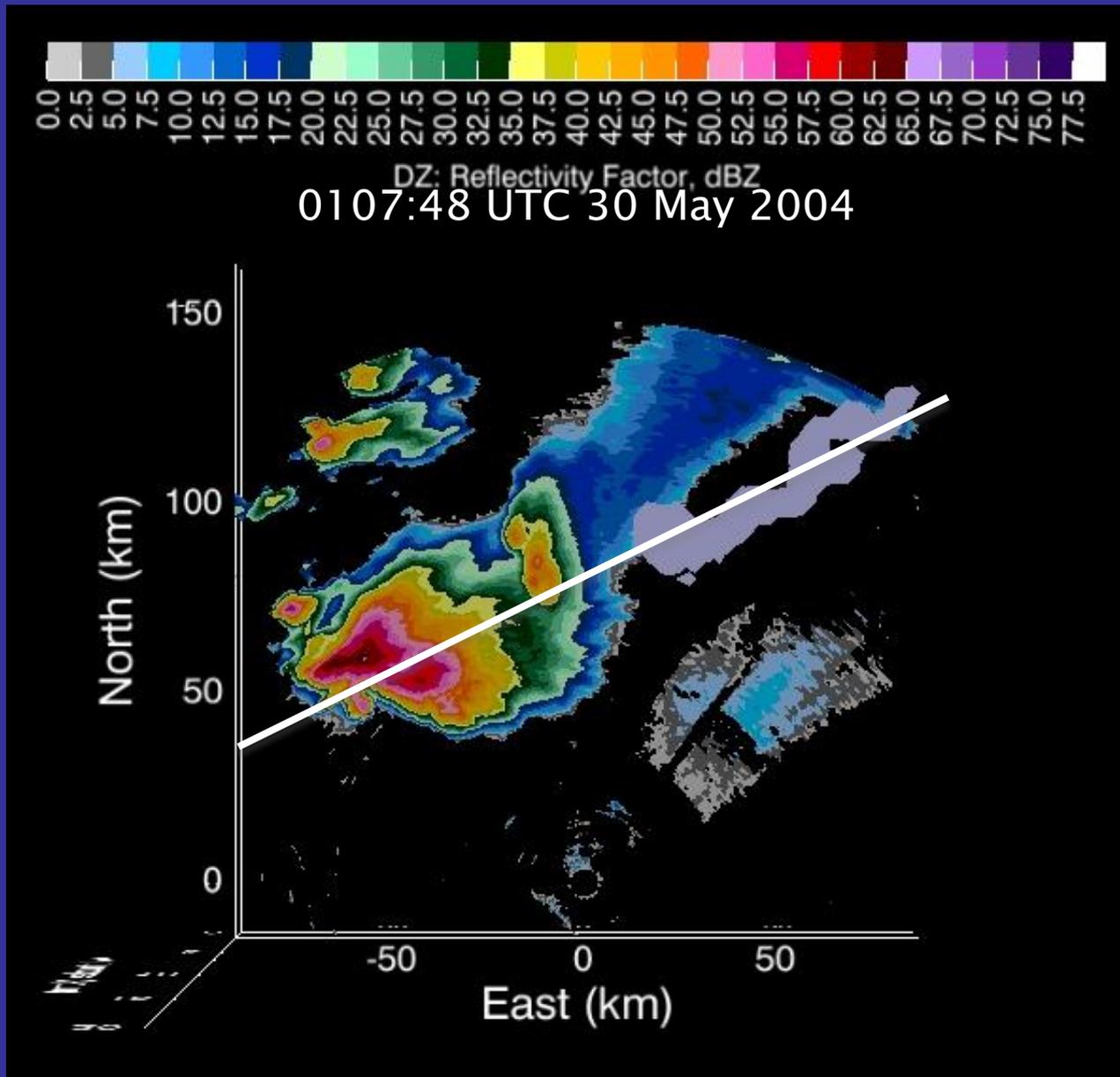
# Flash Initiation in Anvil: Reflectivity Max



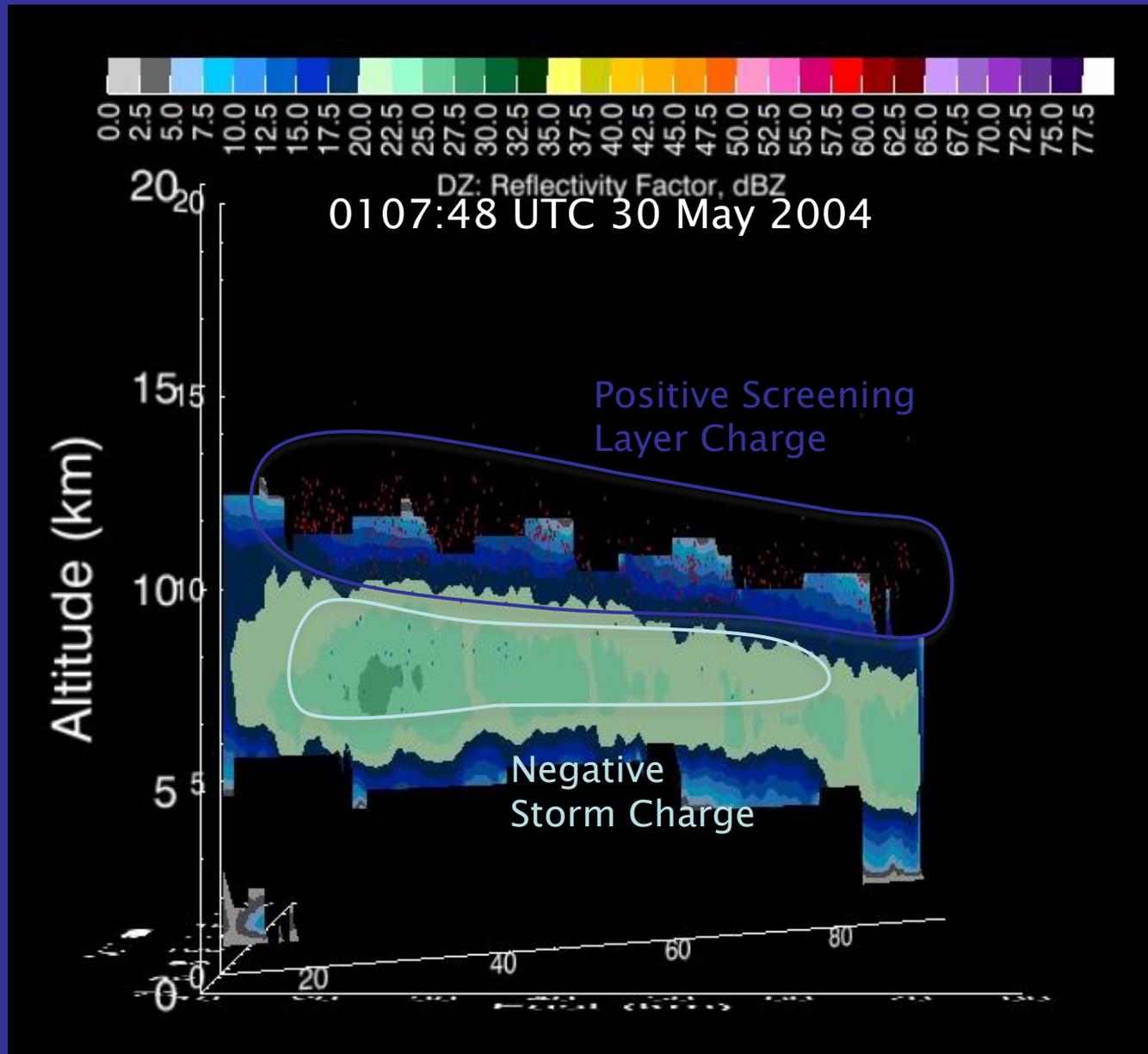
# Flash Initiation in Anvil: Reflectivity Max



# Flash Initiation in Anvil: Screening Layer



# Flash Initiation in Anvil: Screening Layer



# Preliminary Findings

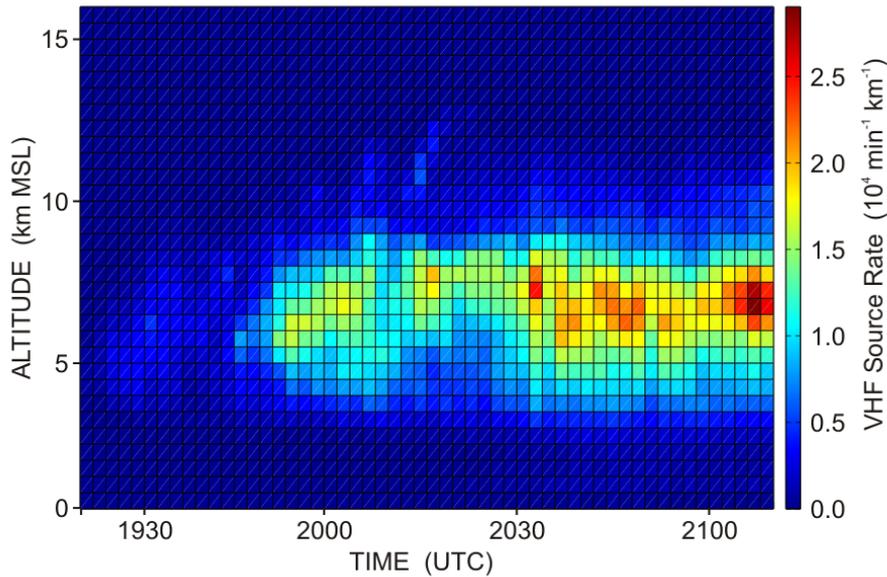
- **Initiation of Anvil Flashes in or near**
  - **Core of storm**
  - **Screening layer charge**
  - **Reflectivity maximum**
  - **Anvil-anvil interaction**
  
- **Ground Flashes beneath Anvil with**
  - **Rain**
  - **Virga**
  - **Anvil below melting/freezing height**

# Preliminary Findings (continued)

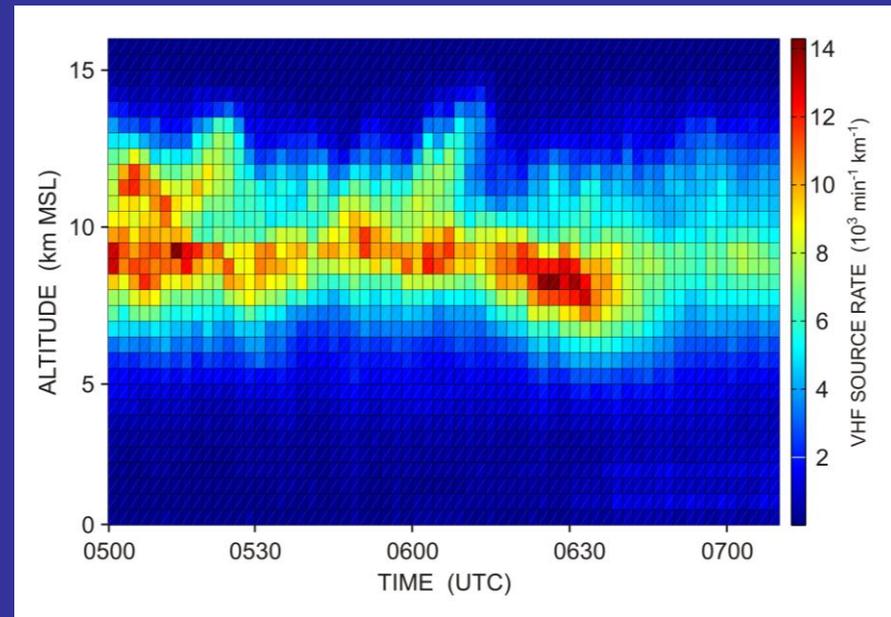
- **Low-top supercells**
  - **2 cold-season cases**
  - **No anvil lightning**
- **Polarimetric radar data comparison**
  - **No obvious patterns**
  - **Helpful in determining freezing level**

# Comparison of Height Distribution in Two Supercell Storms

## Seasonal Variation

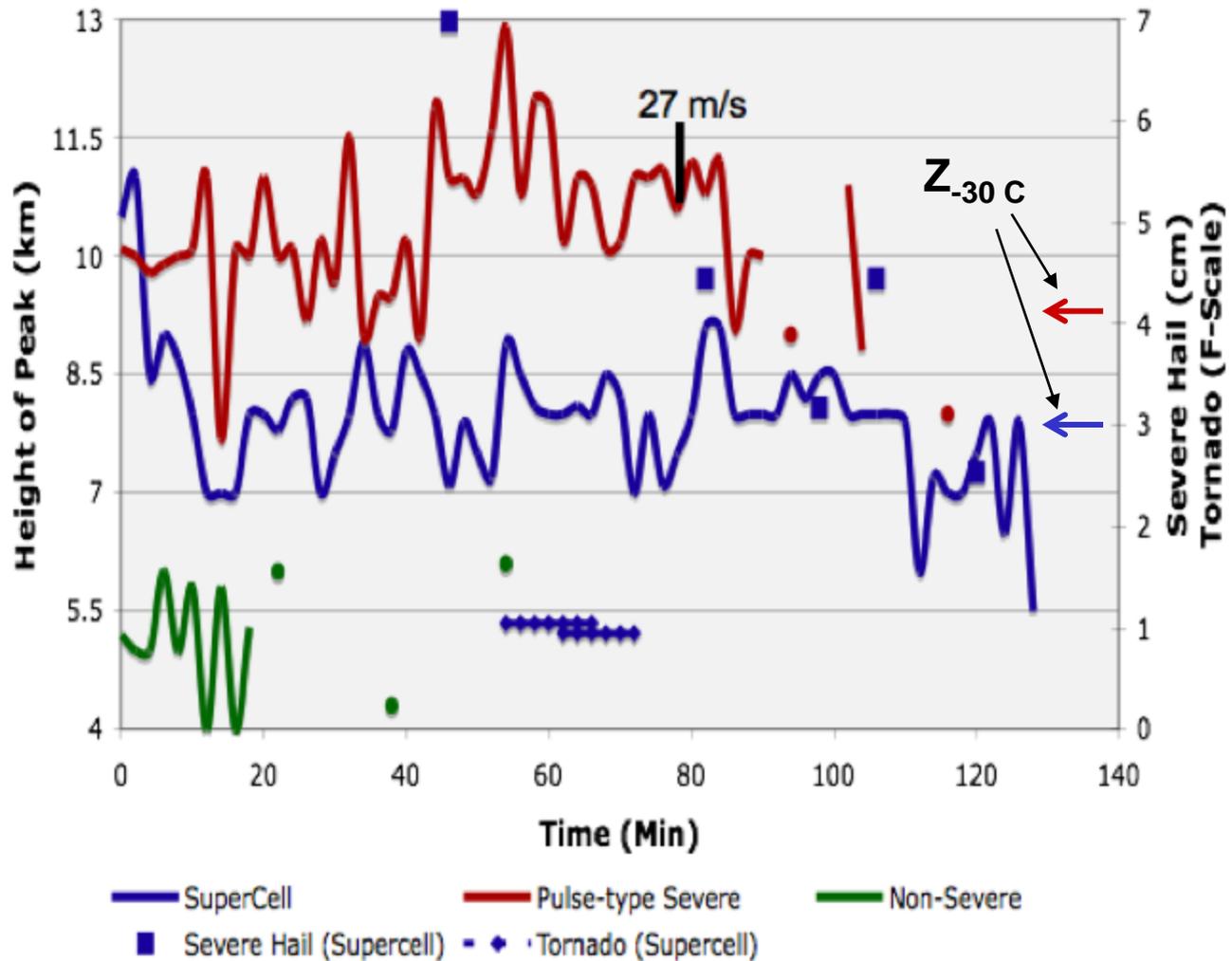


Mid-February



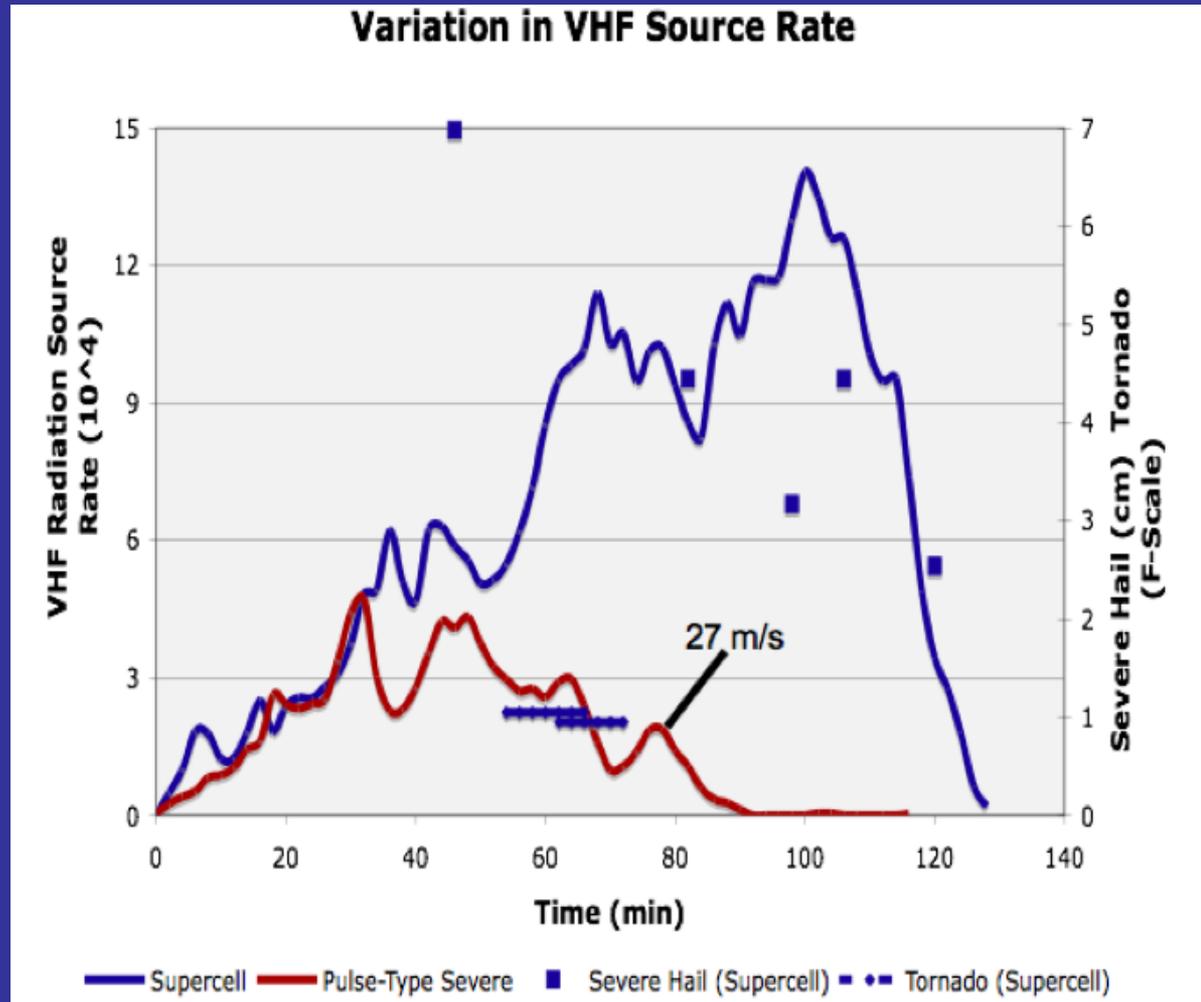
Late March

## VHF Radiation Height of Peak Comparison



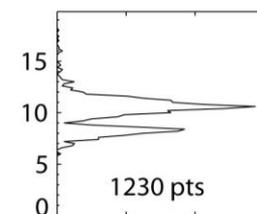
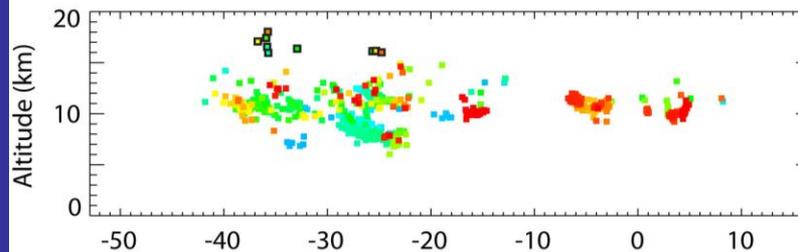
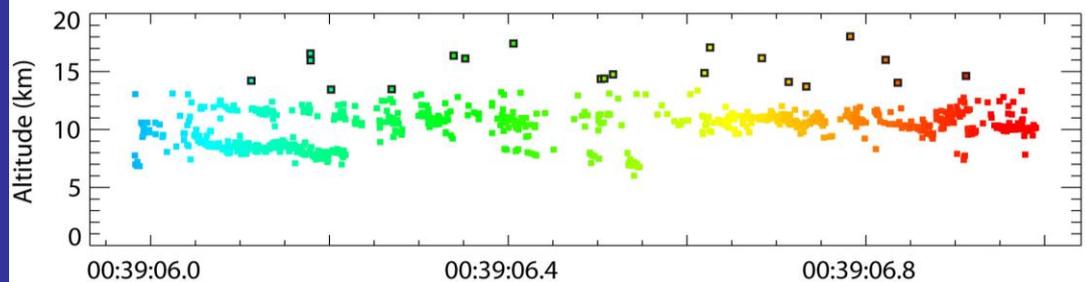
Height of peak in vertical source distribution coincides roughly with height of -30 deg C isotherm

# Sources / 2 min in 3 Storms of Varying Severity

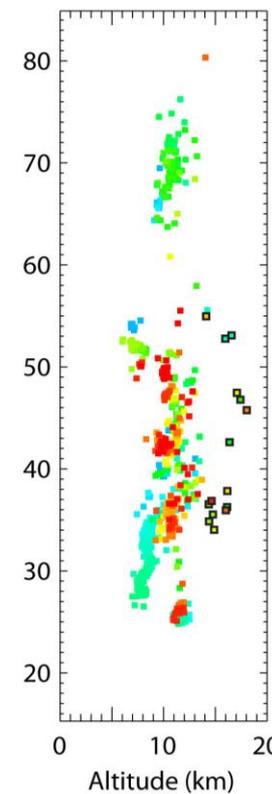
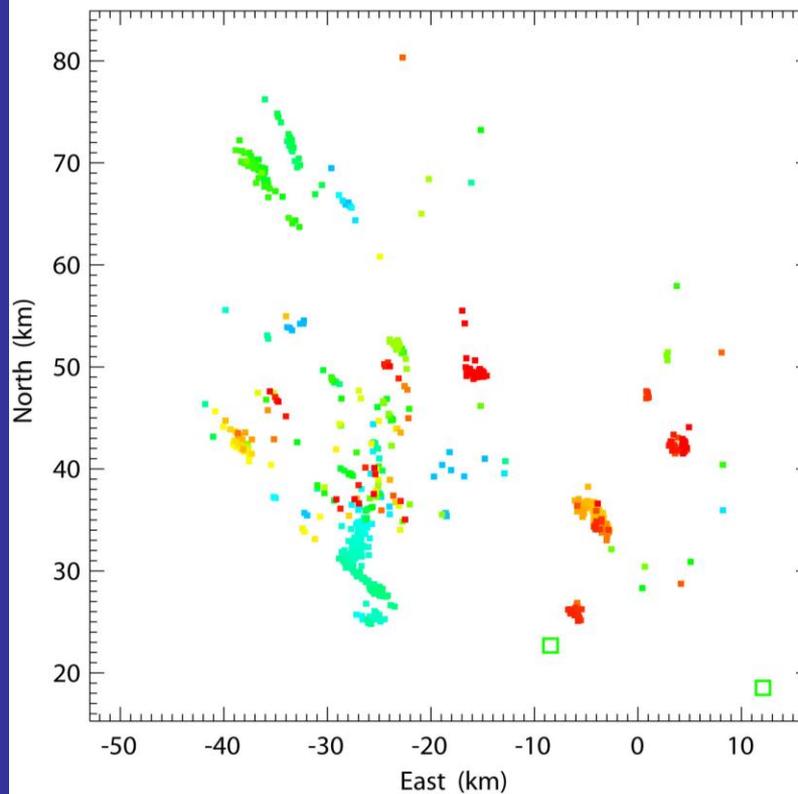




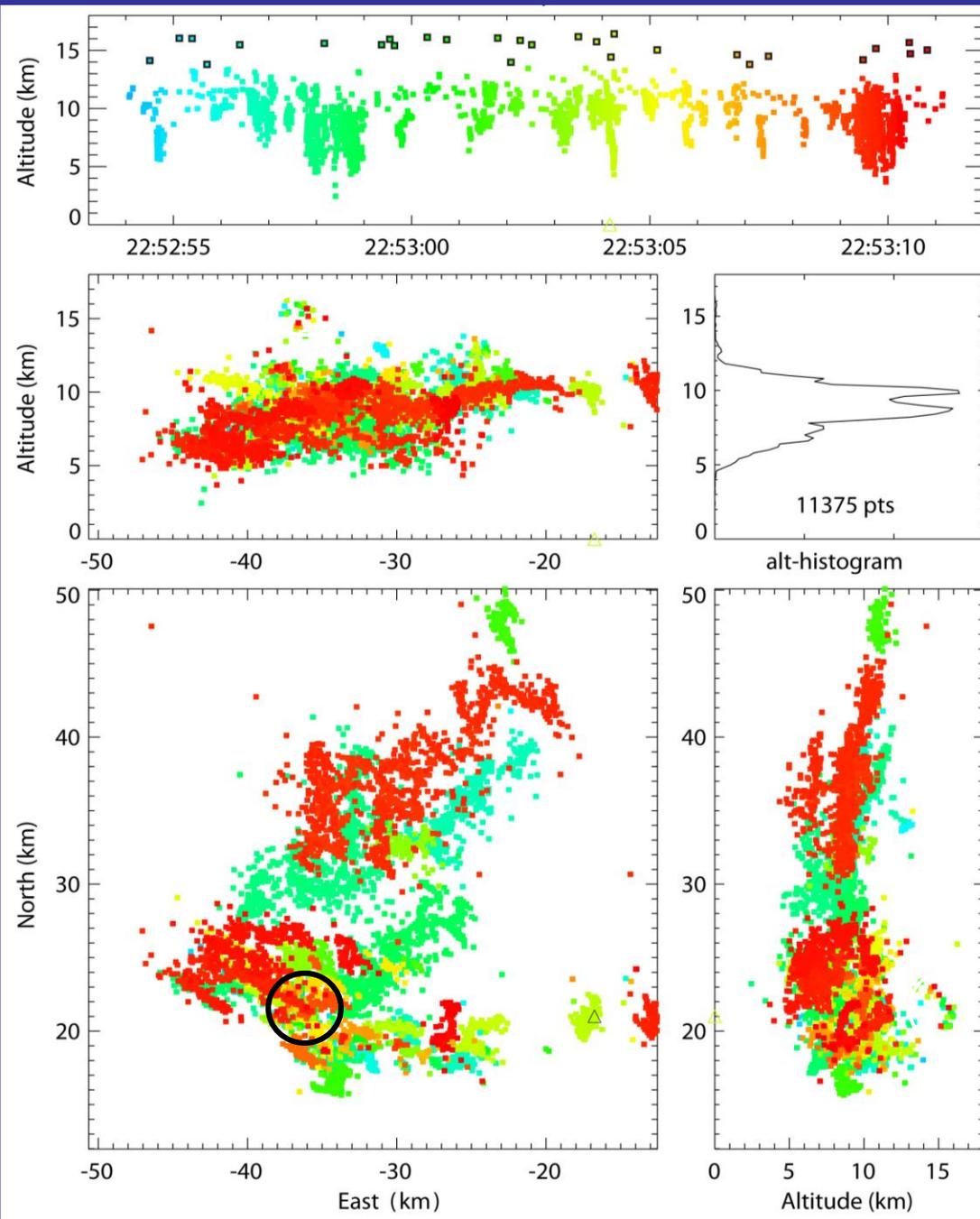
**30 May 2004**  
**00:39:06 UTC**  
**1 second**



alt-histogram

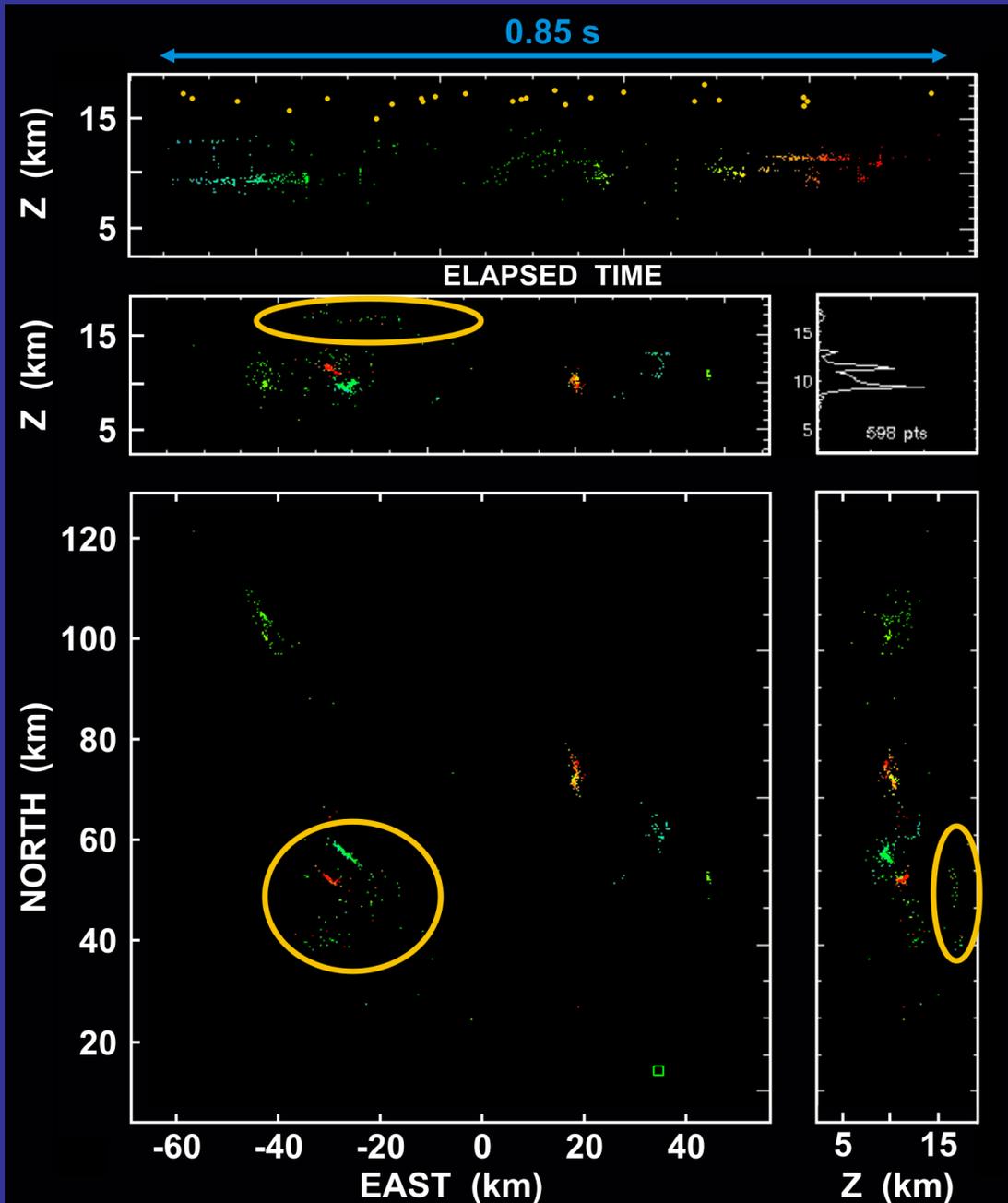


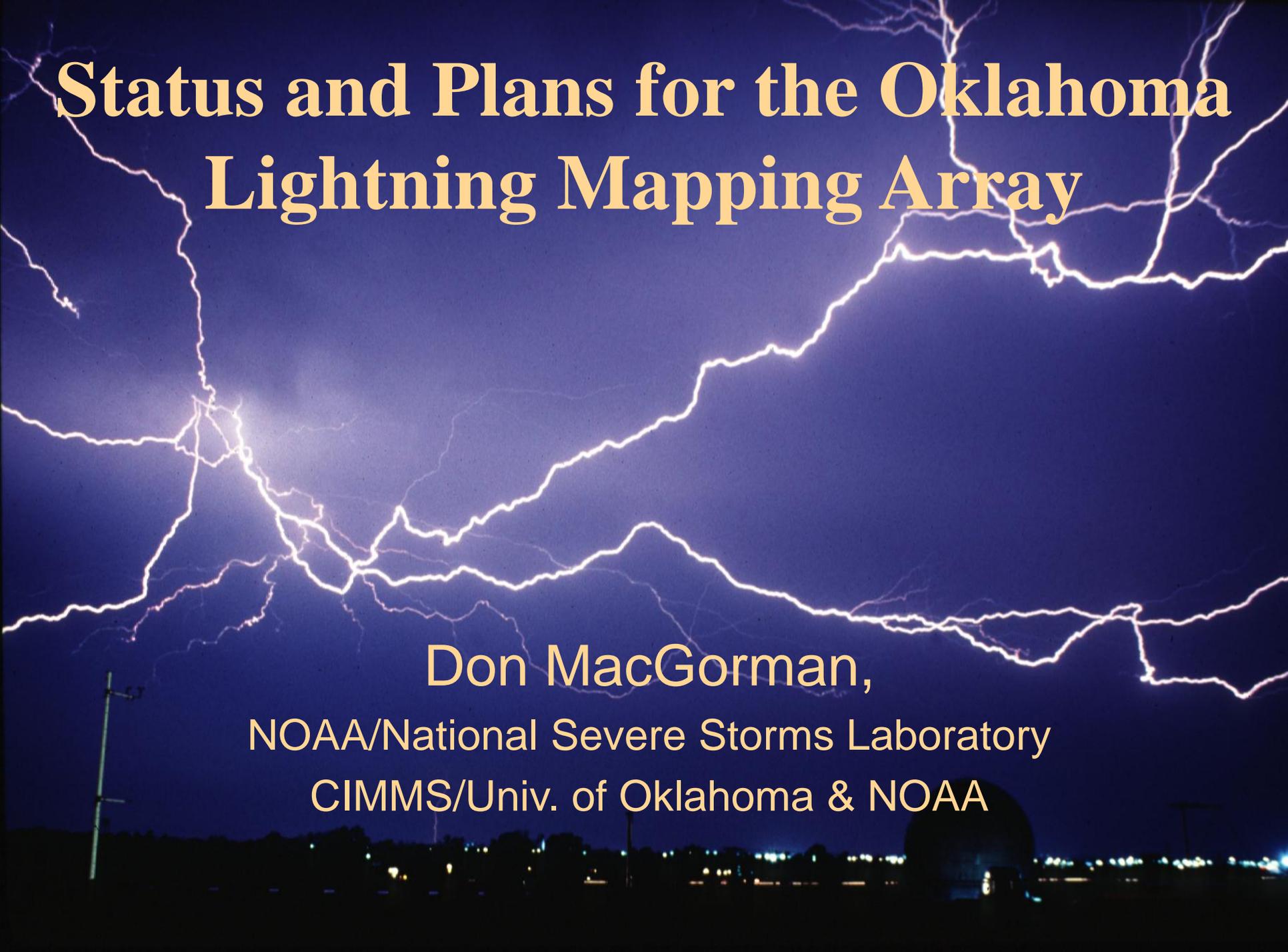
26 May 2004  
22:53 UTC  
17 seconds



# LMA Mapped Points

30 May 2004  
0010:21 UTC

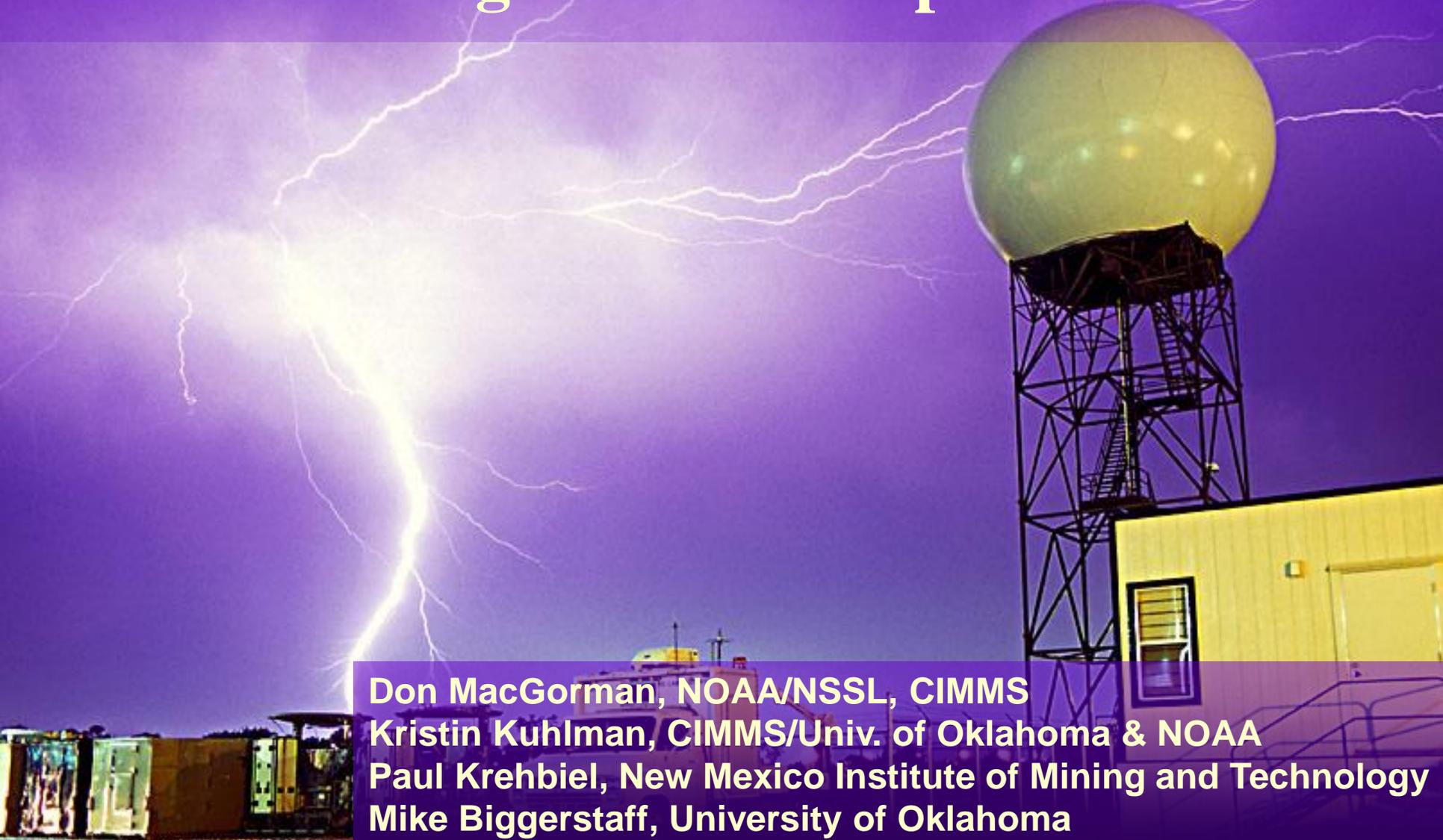




# Status and Plans for the Oklahoma Lightning Mapping Array

Don MacGorman,  
NOAA/National Severe Storms Laboratory  
CIMMS/Univ. of Oklahoma & NOAA

# Small Continual Lightning Activity in the Overshooting Turret of Supercell Storms



**Don MacGorman, NOAA/NSSL, CIMMS**  
**Kristin Kuhlman, CIMMS/Univ. of Oklahoma & NOAA**  
**Paul Krehbiel, New Mexico Institute of Mining and Technology**  
**Mike Biggerstaff, University of Oklahoma**