MIPS, MAX facilities and operations during PlOWS

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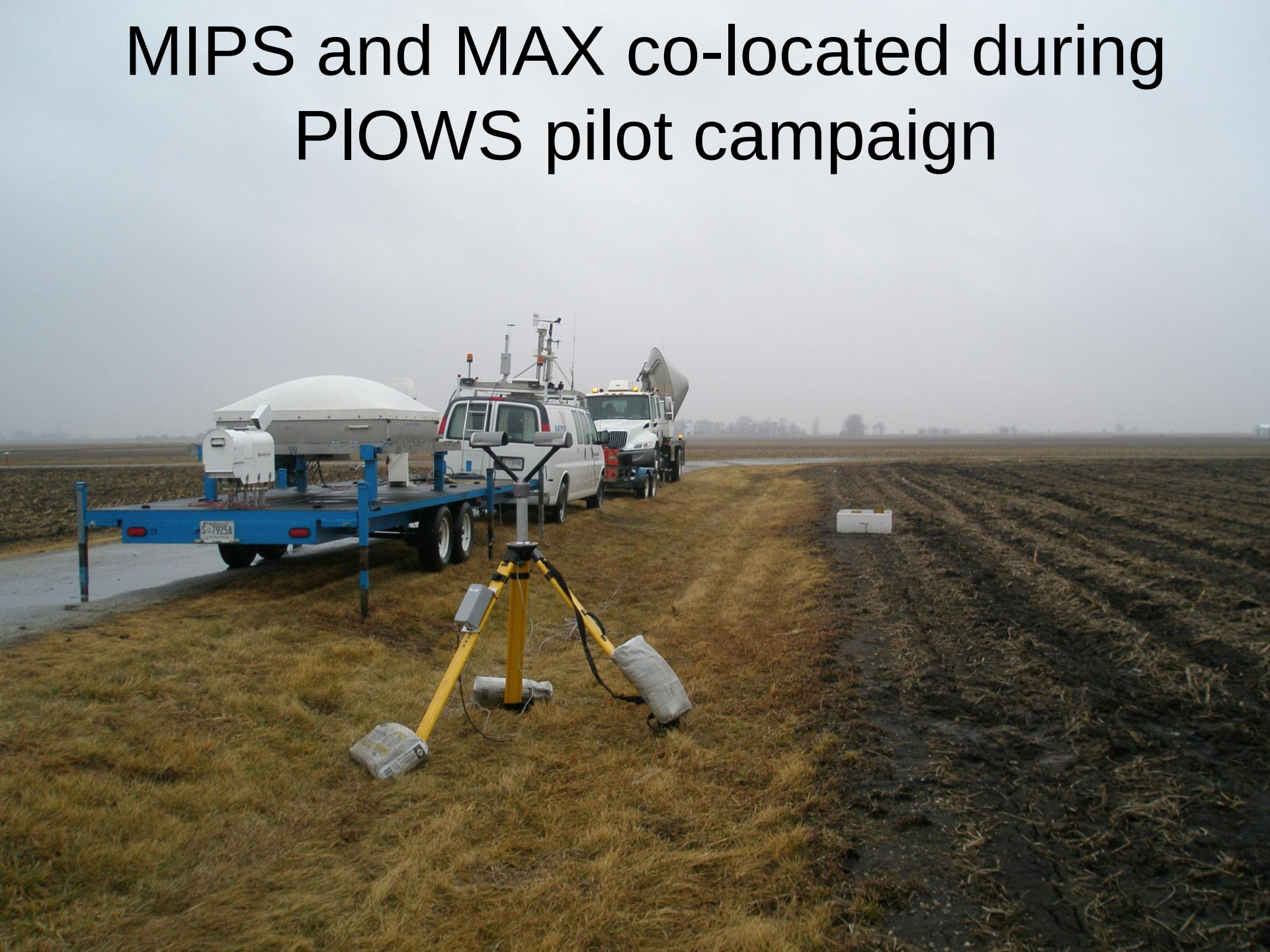
UAH Facilities during PlOWS

- MIPS: Mobile Integrated Profiling System
  - Van/trailer (instruments) + pickup/trailer (generator)
- MAX: Mobile Alabama X-band dual polarization radar
  - Radar truck + 4WD crew cab pickup
- M^3V: Mobile Meteorological Measurement Vehicle
  - Car equipped with meteorological sensors

MIPS and MAX co-located during PlOWS pilot campaign



MIPS: Mobile Integrated Profiling System

Vertical profiles of:

Wind, T, RH, precipitation,
aersols, cloud base

Deployment near Jacksonville
for landfall of TS Fay

MIPS components

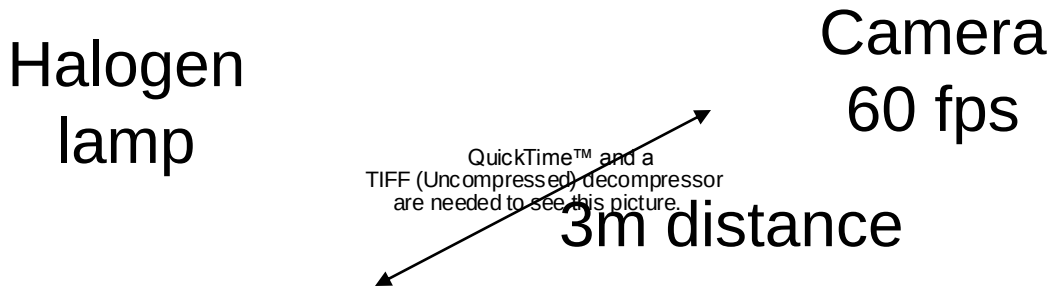
- Remote sensing:
  - 915 MHz wind profiler
  - X-band profiling radar [2 weeks behind schedule :-( ]
  - Lidar ceilometer
  - 12 microwave profiling radiometer
  - Automated digital camera [not yet, but will have in place]
- Sounding System (near future)
- Surface
  - Meteorological: T, RH, p, wind, solar
  - Parsivel disdrometer
  - Raingages (heated)
  - Snowflake Video Imager (borrowed from NCAR; likely)
  - Electric field mill from MSFC (?)
  - Hot plate gage (“possibility”)

Blue = new components

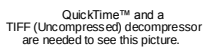
X-band profiling radar

Snowflake video imager (SVI)

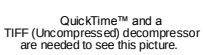
- POC: Paul Kucera, NCAR



From Newman et al (2009)

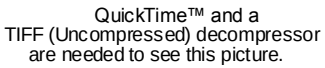


Snowflake rate (per minute) during a Boulder storm



Snowflake size distribution for the same storm

Snowflake images showing various degrees of blurring. The amount of blurring is related to camera and analysis software settings. Sizes can be obtained from blurred images, but habit identification requires a realitvely high-quality image.



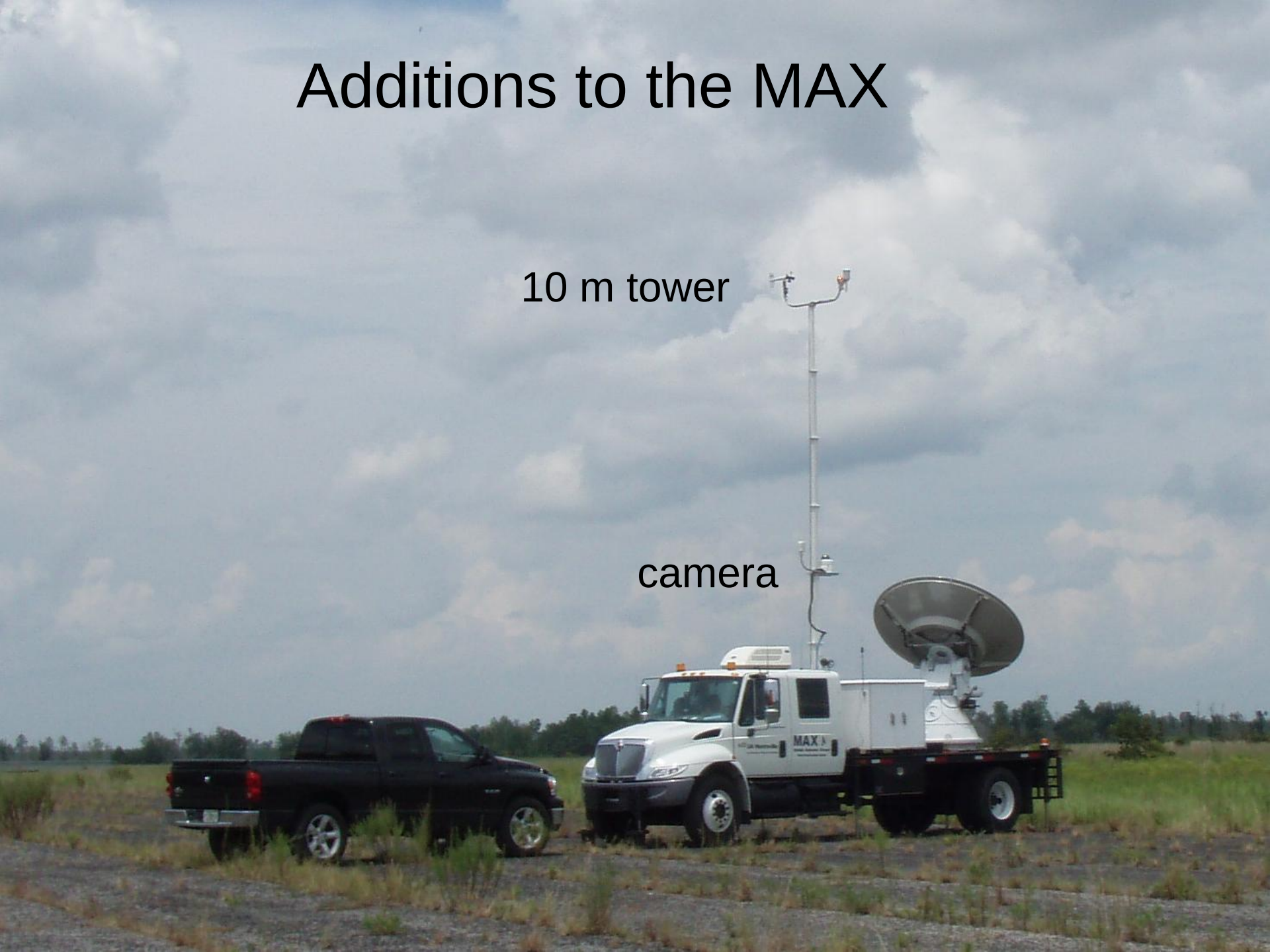
From Newman et al (2009)

MAX: **M**obile **A**labama **X**-band dual polarization radar

- **Transmit frequency:** 9450 MHz (H+V, H)
- **Peak Power:** 250 kW
- **Pulse width:** 0.4 – 2.0 μs
- **Min/Max PRF:** 250 / 2000 s^{-1}
- **Antenna Diameter** 2.4 m (8 ft)
- **Antenna Gain** 44.5 dB
- **Antenna Beam width:** .95°
- **Scanning:** 0-360 Az., 0.5-90 Deg. El.
- **First side-lobe:** -31 dB
- **Cross-pol isolation:** <-36 dB
- **Receiver polarization:** RVP/8
- **Variables:** Z, V, W, ZDR, ϕ_{DP}, KDP, ρ_{hv}, LDR
- **Setup:** MAX can be fully operational within 10 minutes of arriving on site.
- **Leveling System:** Automatic, .01° Accuracy

Near Joliet, IL, Feb. 2009

Additions to the MAX



M3V: **M**obile **M**eteorological **M**easurements **V**ehicle

End of facilities, operations is next

Operations -- Equipment setup

MIPS setup (30-60 initially, less later in the project)

- Level (auto)
- Install ceilometer, MPR on trailer
- Install Parsivel, SVI, hot plate & gages, field mill

MAX setup (10 min)

- Park
- Level (auto)
- Raise tower

Operations during the event

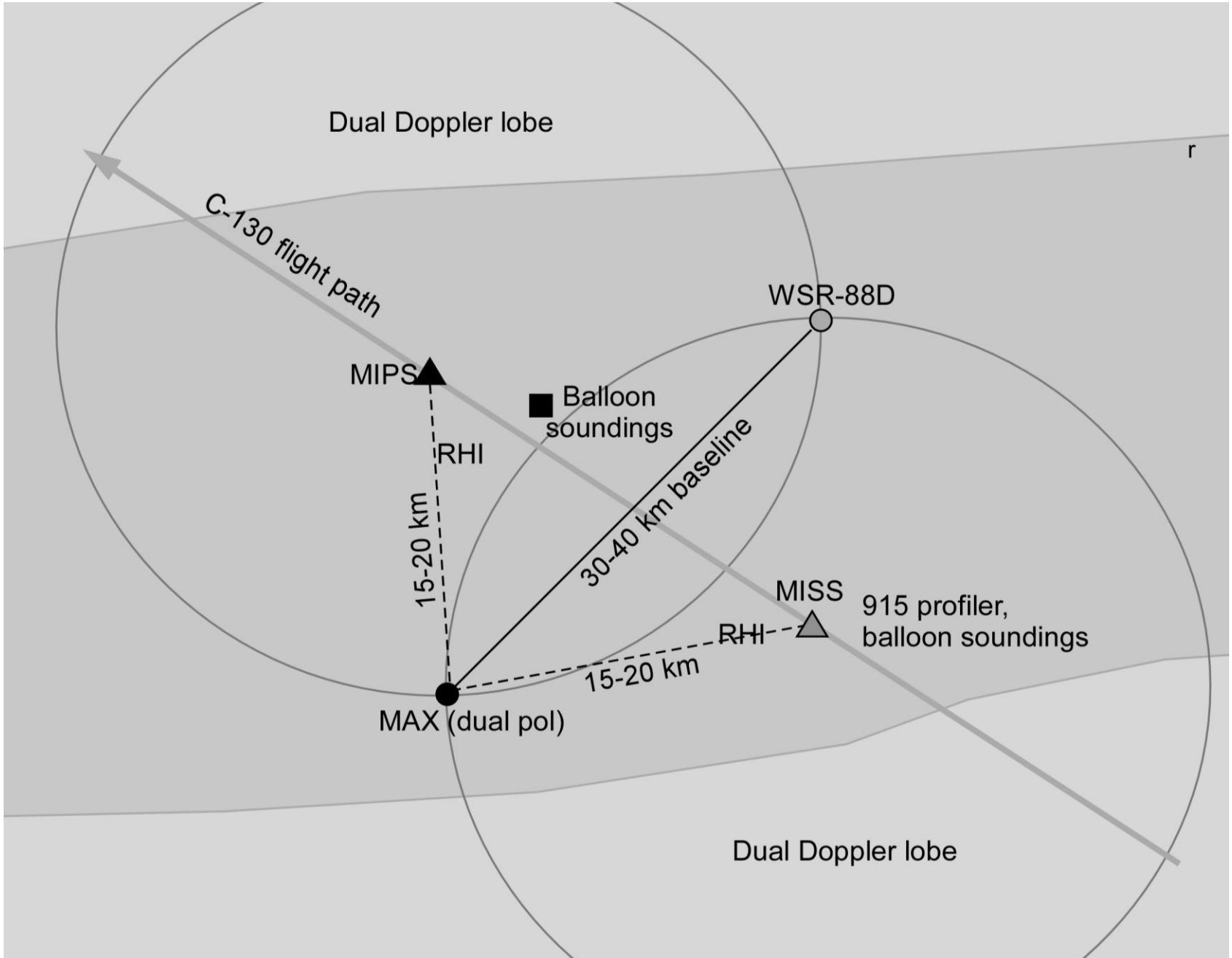
MIPS

- Monitor instruments
- Take notes (instrument problems, interesting observations)
    - vertical motion, snow habit

MAX

- Monitor scans
- Change if necessary
- Take notes (instrument problems, interesting observations)
    - Bands, etc.

Experimental configuration for 2009-2010



MAX scan sequence

- VAD
  - Mimic VCP-11 + 60 deg
- RHI
  - Over MIPS and MISS
- Cycle time same as VCP-11 cycle time

Experiment configuration