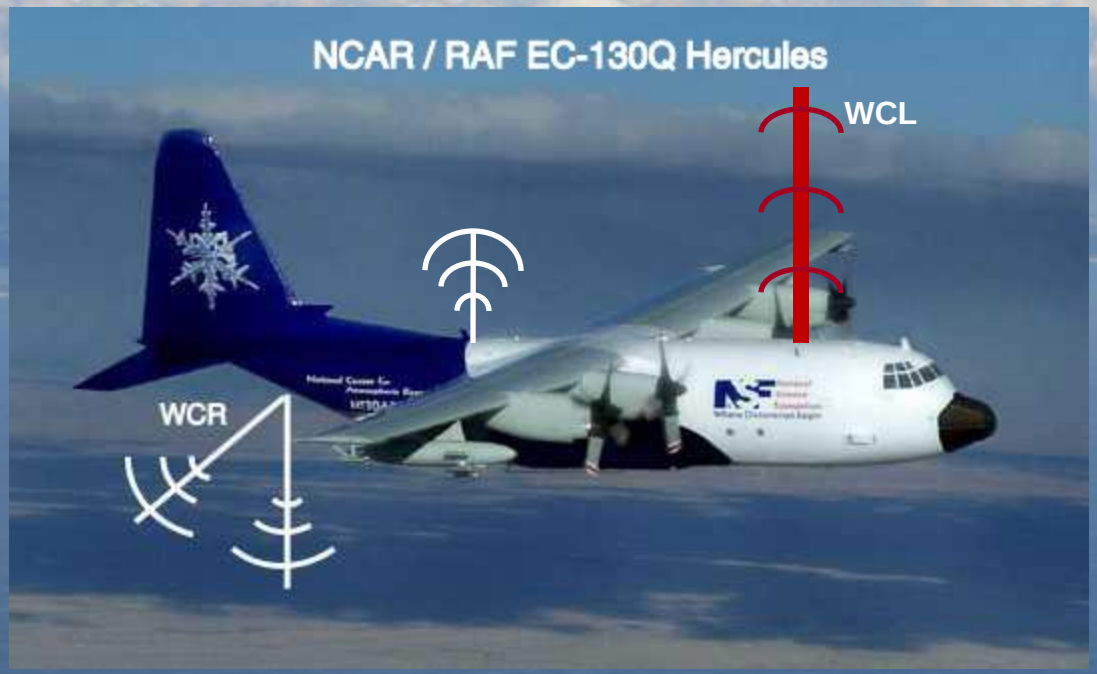
ATMOSPHERIC SCIENCE

King Air Research (n2uw)

Overview of the participation of the Wyoming Cloud Radar (WCR) and the Wyoming Cloud Lidar (WCL) In PLOWS

UWKA Research Group &
Faculty and Scientists
within DAS

WCR & WCL on C130 summary



WCL: 1 beam– vertical up
no blind zone, nearest ~100 m corrected for overlap
~3.75 m along-beam sampling

WCR: 3 beams-- nadir, nadir-aft, up
sensitivity better than -30 dBZ at 1 km
~125 m blind zone near aircraft, ~6 km max range
~15-25 m along beam sampling, 5 m along track

WCR

Proposed Operational Modes

- Up only
- Up/Down (profiling)
- Up/DualDown (profiling)
- All modes available at 3 or 6 km max range

Products for all modes include Reflectivity and mean (aircraft-corrected) Doppler Velocity

250 ns transmit pulse length (~37.5 m resolution, sampled at 15 or 22.5 m (3 or 6 km max range, respectively)

+/- 15.8 m s^{-1} unambiguous velocity

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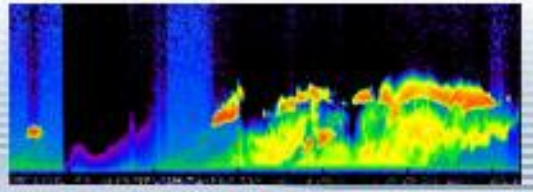
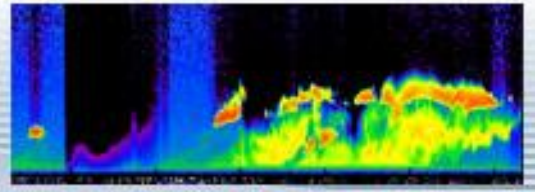
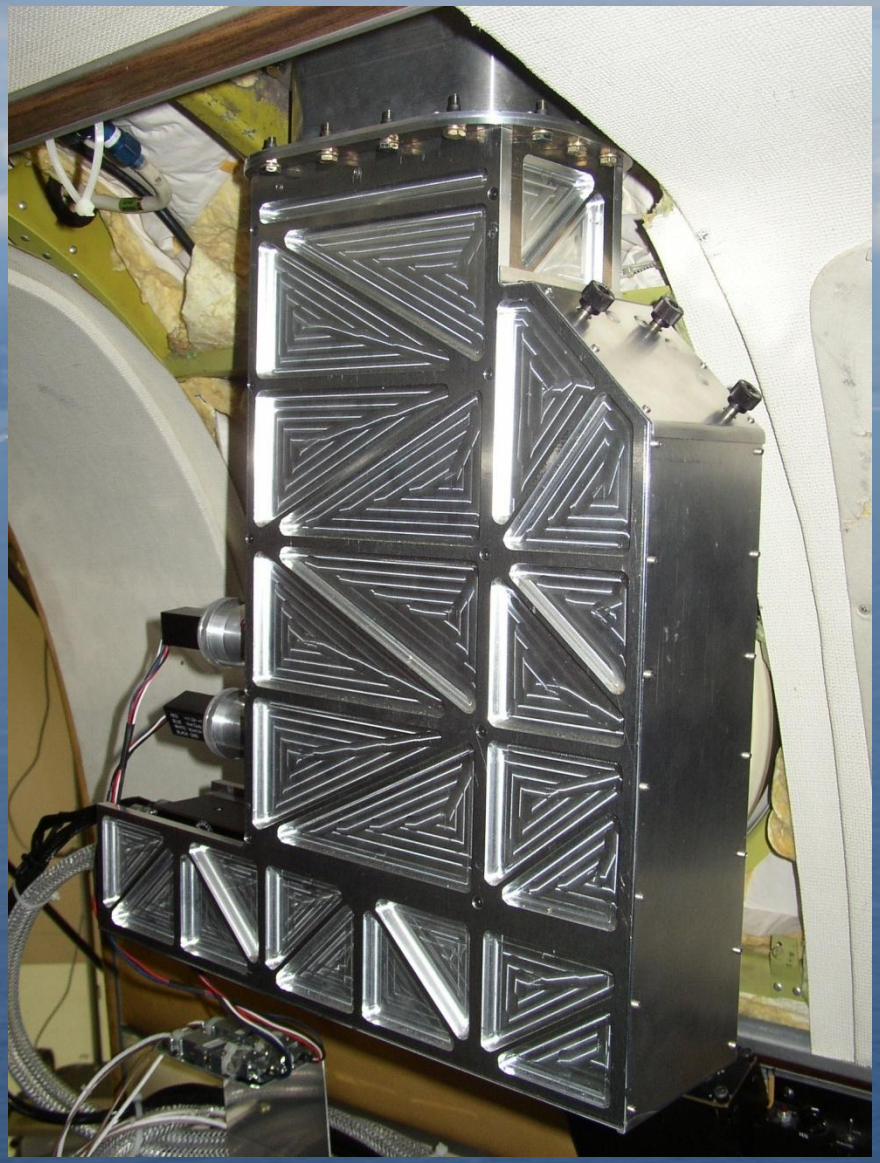
Wyoming Cloud Lidar



Transmitter	
•Laser Wavelength	355 nm Nd:YAG
•Pulse Repetition Frequency	20 Hz
•Pulse width	~8 ns
•Pulse Energy	16 mJ
Receiver	
•Diameter	~ 75 mm
•Field of view	300 and 2000 μrad
Data System	
•Number of Channels	Two
•Detector	PMT
•Spatial Resolutions	Vertically:3.75m, 7.5m, 15m, 30m (programmable) Horizontally: ~20m
•Data acquisition system	Combined analog and photon counting system from LICEL, GmbH

Wyoming Cloud Lidar





WCL

Operations

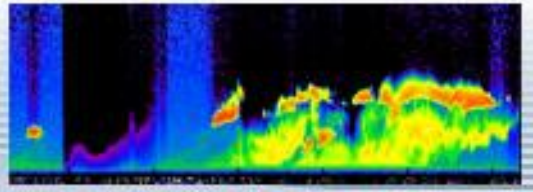
- Up only

Recording of two channels (parallel and perpendicular)

- Returned Power
- Linear Depolarization Ratio

Retrieved/Interpreted Quantities

- Extinction
- Ice water content (w/ WCR)
- Identification of regions of liquid and ice hydrometeors



DATA AVAILABILITY:

WCR

- Quicklook Reflectivity images available within 24 hours following a flight
- “Initial” processed Reflectivity and aircraft-corrected Doppler velocity likely available by mid-project, netCDF products
- Final processed data available 1-2 mos. following release of final aicraft data set

WCL

- Quicklook (uncorrected/uncalibrated) power and LDR available within 24 hours
- Final processed data available following project, special products through Zhien Wang, WCL PI