ARL Lidar in MATERHORN-X

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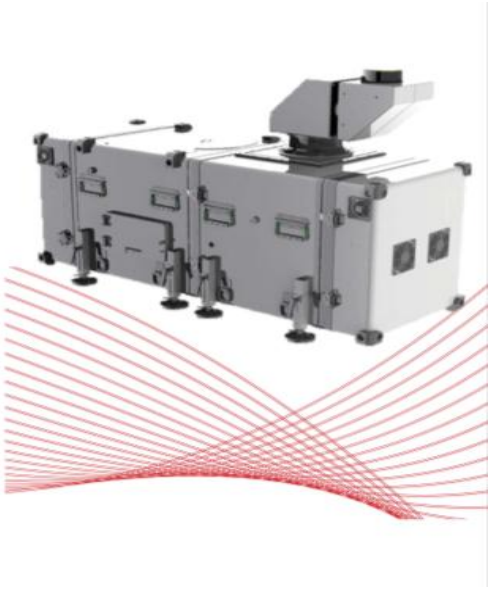
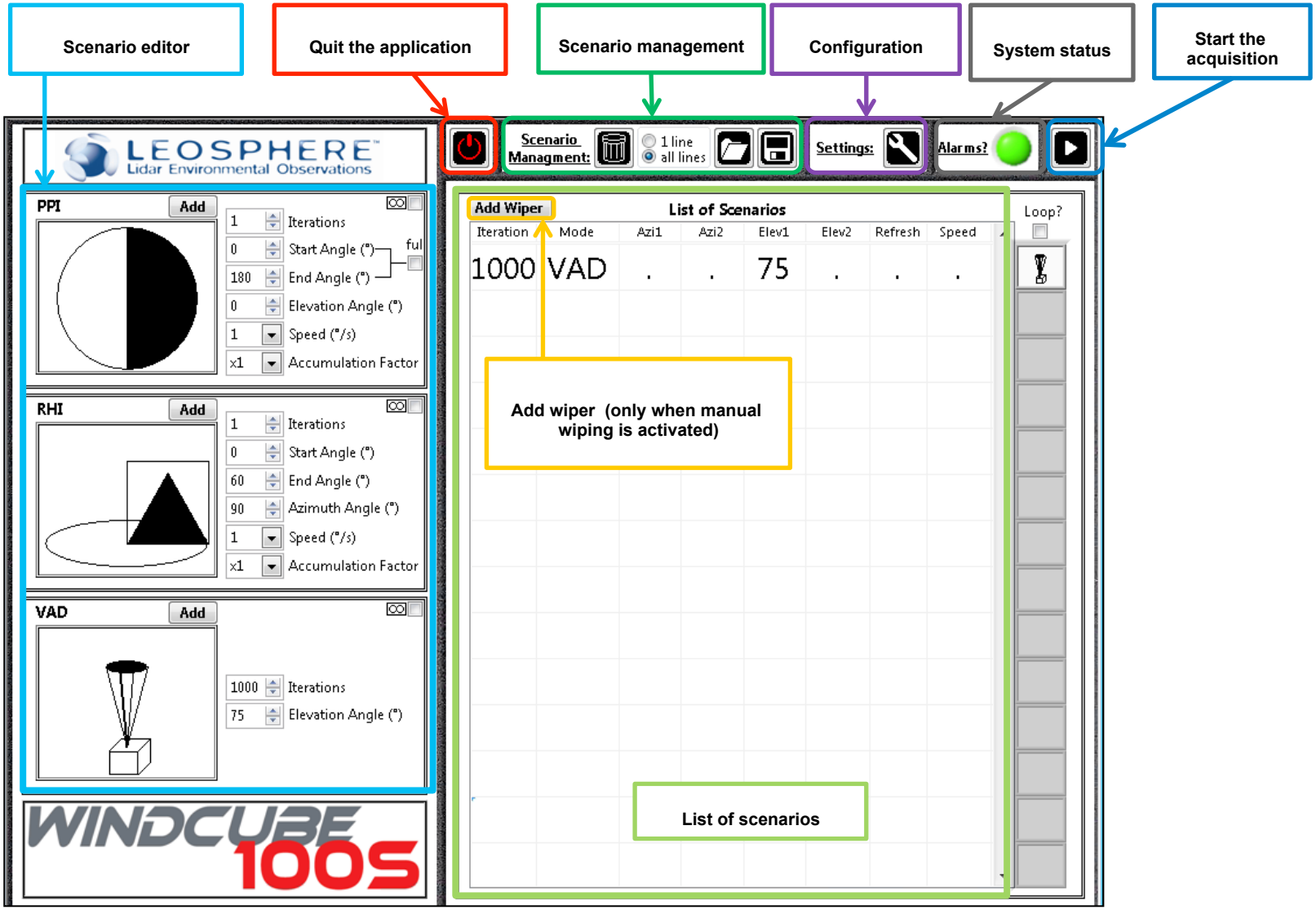
Leosphere Windcube 100S™

Performances	
Maximal range	8000m
Wind measurement range (on aerosol – within boundary layer)	100 to 3500m
Accumulation Time	1 s – 1,5s – 2s
Data output frequency	1 Hz
Resolution range	50m -100m - 200m
Probed length	37.5m – 75m – 150 m
Minimum distance between 2 probed lengths	1m (manual configuration only)
Azimuth scan range	0°à 360°
Elevation scan range	-10°à 190°
Speed Accuracy	0.5m/s
Speed range	±30m/s
Laser	
Wavelength	1,54 µm
Eye safety	IEC/EN 60825-1 compliant / ANSI-Z136.1-2007 compliant
Environmental	
Temperature Range	-15 to +40℃
Operating humidity	IP65 (streaming)
Rain protection	Wiper (available in summer 2012)
Compacity	Portable (4 people)
Dimensions	
Weight	170 kg
Dimensions	L1570 x l680 x h640 mm for body and h=1000 mm with the scanner head
Power Supply Specifications	
Electric Power Supply	27 VDC
Power consumption	500W to 2000W
Data	
Format	ASCII/Binary
Transfer	Ethernet/USB

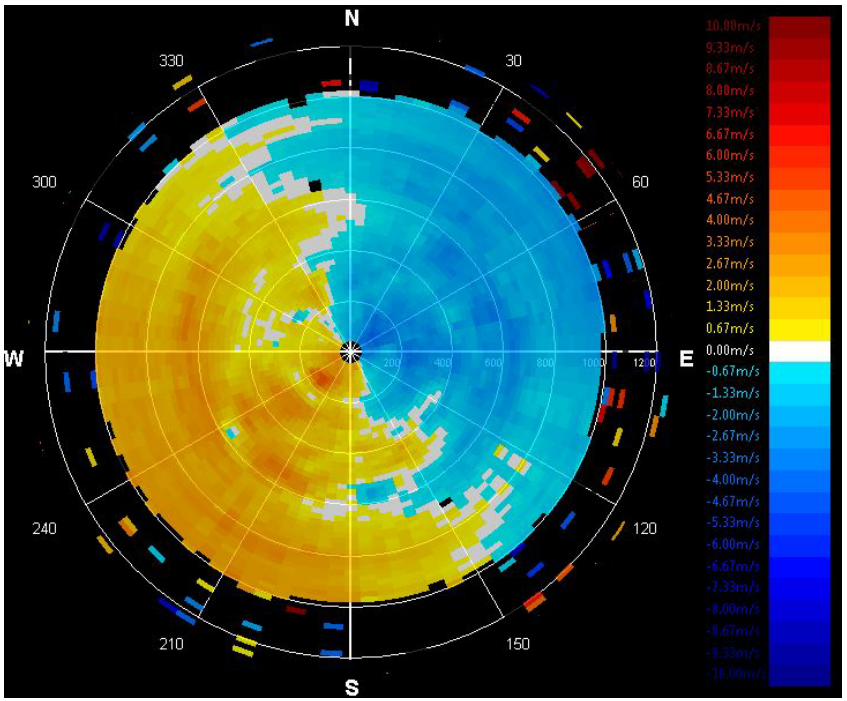


From Leosphere Manual

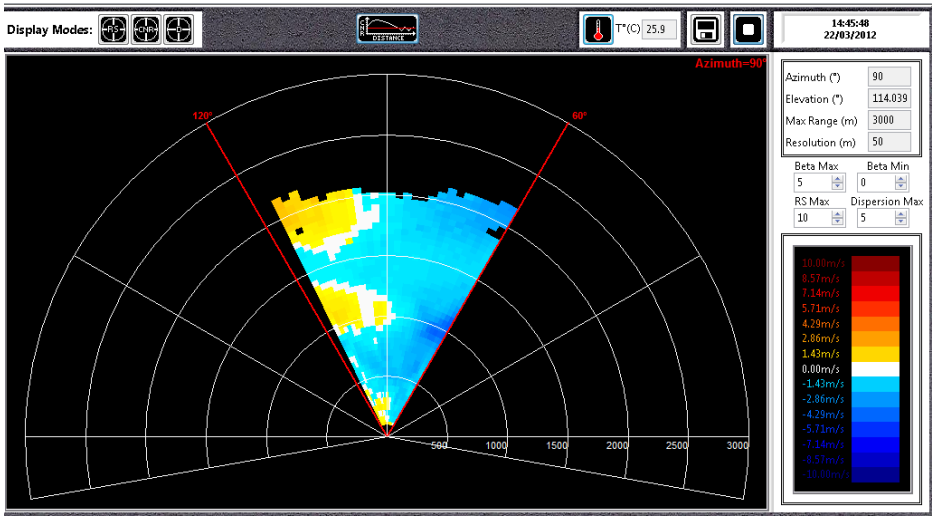
Scanning Programming



Data Samples from Leopshere Windcube 100S

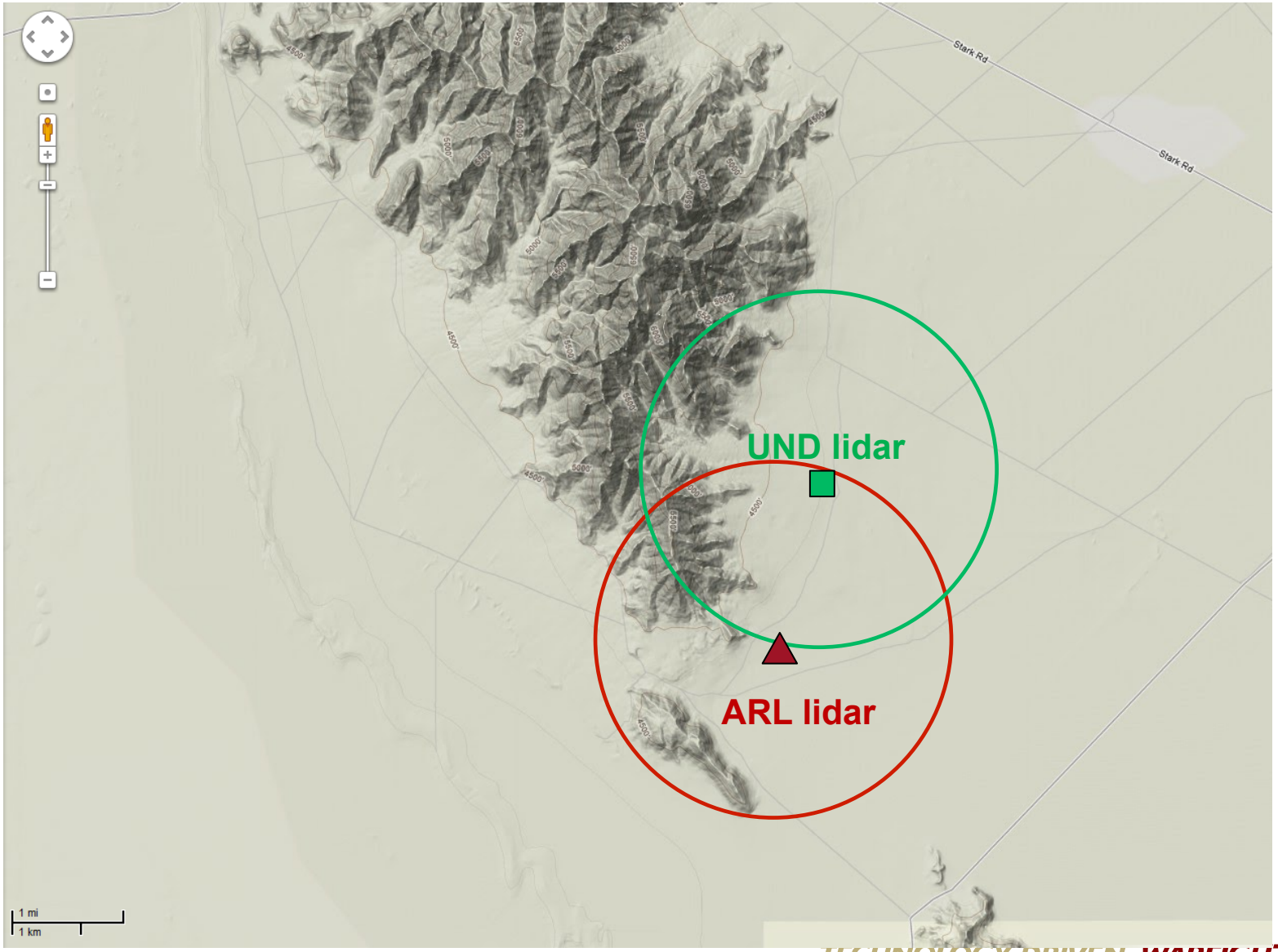


A PPI Scan (elev. Angle=60^0)



A RHI Scan (Azmuth Angle=90^0)

Lidar Aeral Coverages (Assumes 3km radius)



Lidar Coordination and Wind Retrieval

Mean Wind

1. Horizontal wind field via PPI scans
2. Virtual towers (vertical profiles) via RHI scans

Large Scale Turbulence Structures

(related to range gate resolutions ~50m)

Data Assimilations with Numerical Models

Other ARL interests from MATERHORN

- Improvement of diagnostic wind model for complex terrains.

- Large scale turbulence structures over complex terrain.

- Validation of a newly developed microscale boundary layer environment model.