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# ARL Lidar in MATERHORN-X

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*TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.*

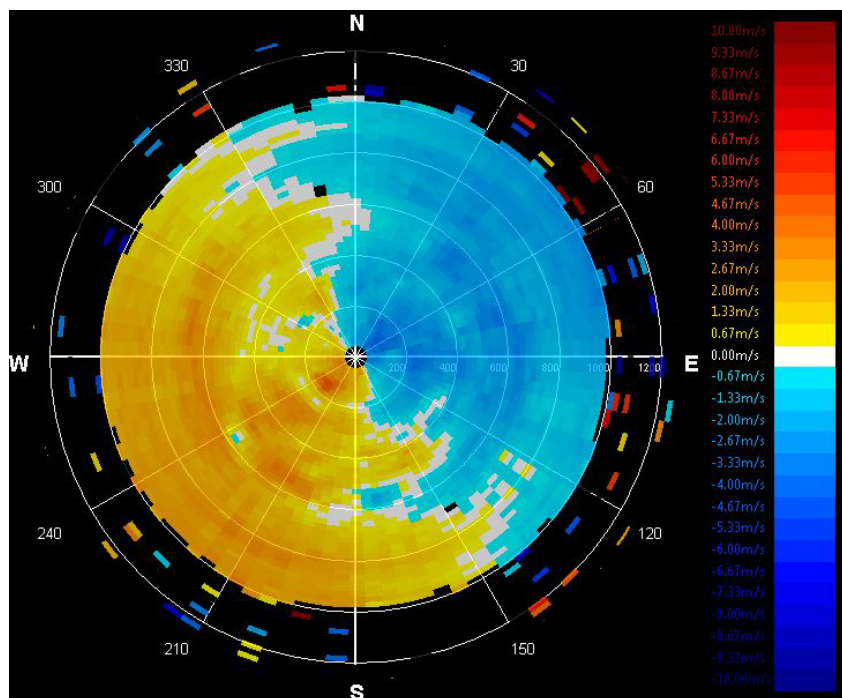
Performances	
Maximal range	8000m
Wind measurement range (on aerosol – within boundary layer)	100 to 3500m
Accumulation Time	1 s – 1,5s – 2s
Data output frequency	1 Hz
Resolution range	50m -100m - 200m
Probed length	37.5m – 75m – 150 m
Minimum distance between 2 probed lengths	1m (manual configuration 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°C
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



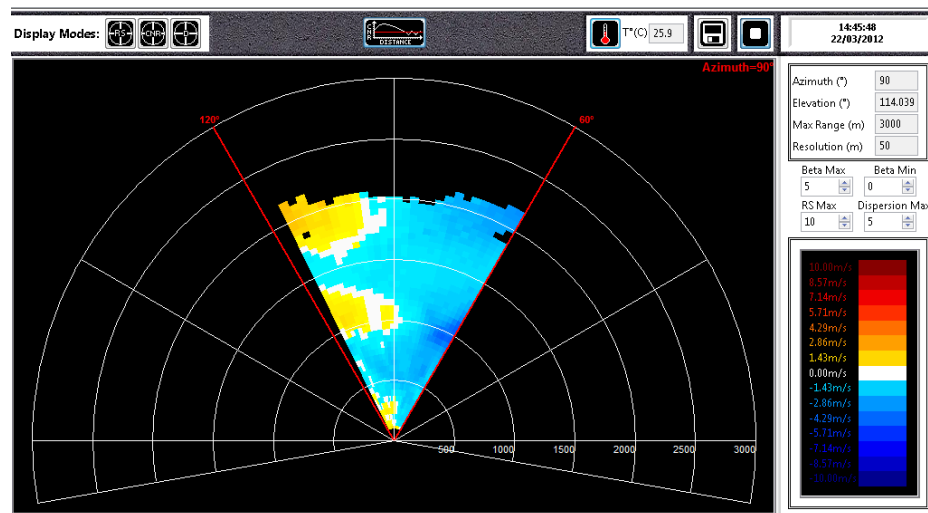
The screenshot shows the LEOSPHERE software interface. At the top, there is a menu bar with icons for power, scenario management, line selection, save, settings, alarms, and play. Below the menu bar, the interface is divided into several sections:

- Scenario editor:** A blue-bordered area on the left containing three sensor configuration panels: PPI, RHI, and VAD. Each panel includes a diagram and a list of parameters such as Iterations, Start Angle, End Angle, Elevation Angle, Speed, and Accumulation Factor.
- Quit the application:** A red-bordered box pointing to the power icon in the menu bar.
- Scenario management:** A green-bordered box pointing to the trash and save icons in the menu bar.
- Configuration:** A purple-bordered box pointing to the settings icon in the menu bar.
- System status:** A grey-bordered box pointing to the 'Alarms?' indicator in the menu bar.
- Start the acquisition:** A blue-bordered box pointing to the play icon in the menu bar.
- List of Scenarios:** A green-bordered table in the center-right showing a list of scenarios. The first entry is highlighted with a yellow box and labeled 'Add Wiper'.
 

Iteration	Mode	Azi1	Azi2	Elev1	Elev2	Refresh	Speed
1000	VAD	.	.	75	.	.	.
- Add wiper (only when manual wiping is activated):** A yellow-bordered box pointing to the 'Add Wiper' button above the first row of the scenario list.
- List of scenarios:** A green-bordered box pointing to the table area.

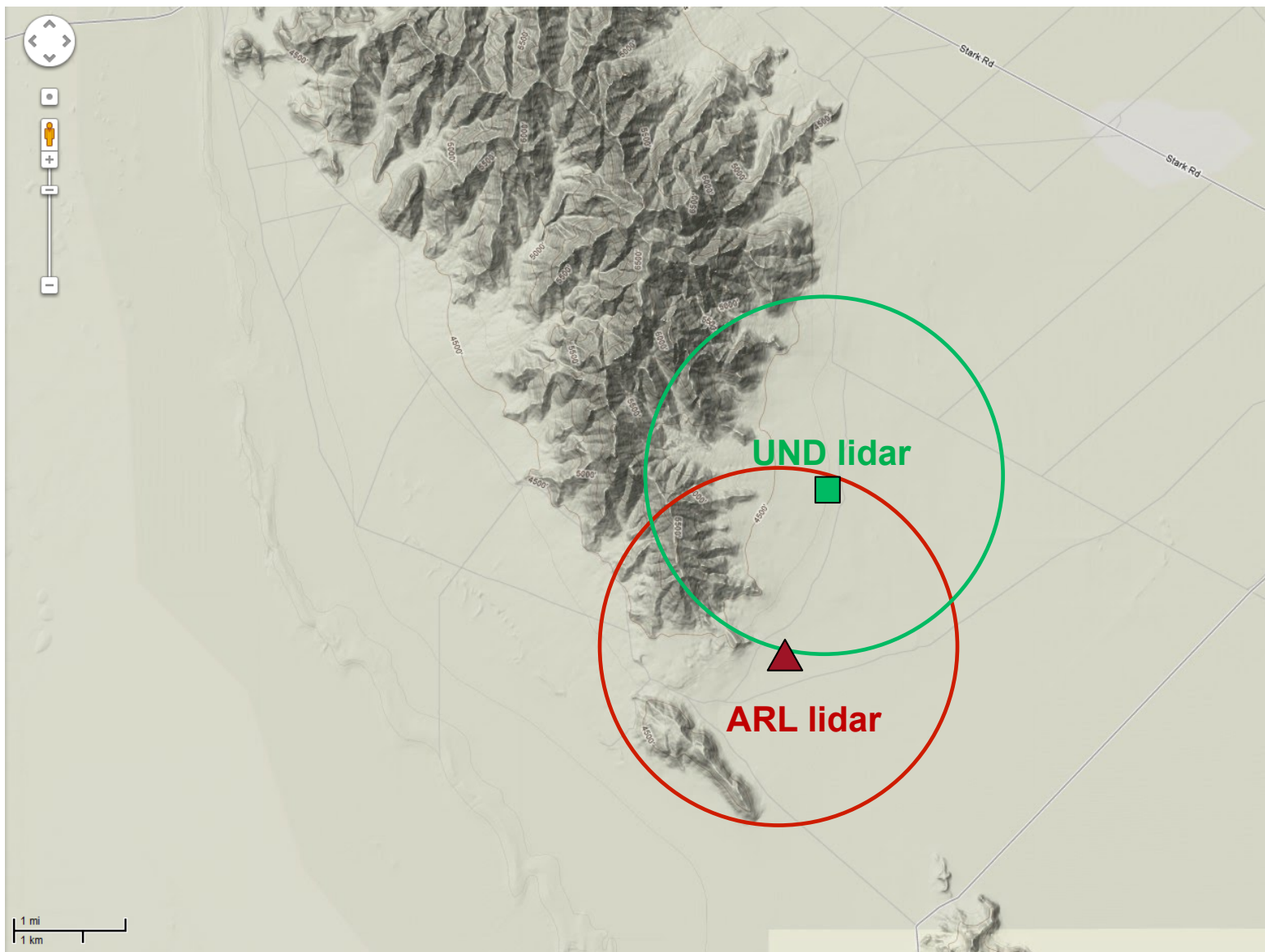


A PPI Scan (elev. Angle=60°)



A RHI Scan (Azimuth Angle=90°)

# Lidar Aerial Coverages (Assumes 3km radius)





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# 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



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## **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.**