

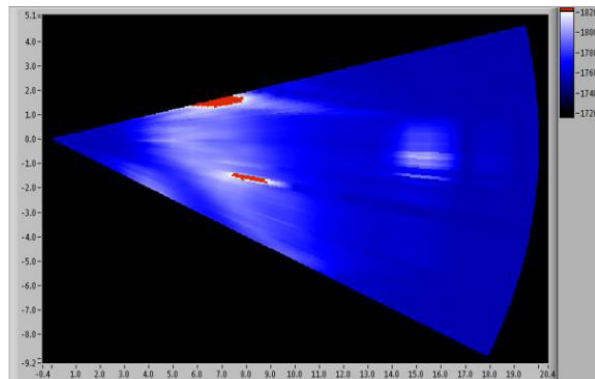
INO

Aeromap

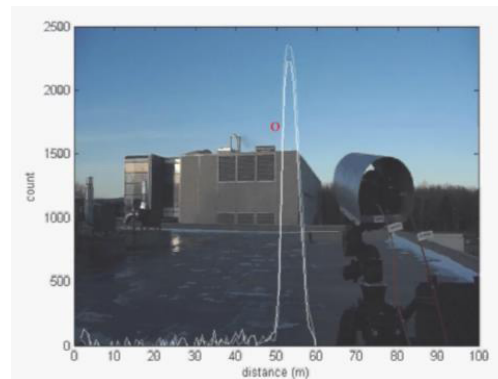
MAPPING SOURCES OF FUGITIVE EMISSIONS

Aeromap is a laser diode-based (NIR) full waveform LIDAR, especially designed for dust and aerosol mapping and monitoring. It identifies and measures relative concentration of aerosol over a range greater than 150 m (500 ft.) with a resolution up to 4.7 cm (typically 75 cm). Aeromap delivers 2D and 3D maps of relative concentration in near real-time for a better understanding of dust generating processes, making it the perfect instrument for fugitive emissions monitoring.

Being eye-safe, Aeromap can be easily deployed on industrial sites or cities. The Aeromap platform is currently at TRL6 and is ready for technology transfer.



2D Map of dust concentration



LIDAR waveform showing dust emission from stack



AeroMap
NIR Full Waveform
LIDAR

Aeromap

NEAR INFRARED, FULL WAVEFORM LIDAR FOR DUST AND AEROSOL MONITORING

Features	Advantages	Benefits
Measures relative concentration of aerosol over a range of 150 m with resolution up to 20 cm (typically 75 cm)	Distribution of aerosol concentration along line-of-sight; Ideal for fugitive emissions monitoring	Equivalent to hundreds of point sensors located along line-of-sight
Typical limit of detection of $50 \mu\text{g}/\text{m}^3$ @ 150 m	Same order of magnitude of air quality standards for total suspended particulates	Can be used to monitor several types of dust generating processes
Eye safe	Harmless to workers	Can be installed on industrial sites or cities
Additional context camera	Helps define the monitoring area. Provides pictures of "events" with concentration overlay	Easy deployment. Better understanding of aerosol generation processes
Pan & Tilt Unit with mapping speed up to $20^\circ/\text{s}$. Acquisition speed: 2 to 10 Hz	Delivers 2D and 3D maps in near real-time	Better understanding of aerosol transport processes
On-board Processing	Real-time display of aerosol concentration.	Can be used to trigger alarms

Specifications Values

Platform use · Dust and aerosols relative concentration and mapping in air

Laser source

- Laser diode wavelength: 905 nm
- Pulse energy: 3 μ J
- Pulse duration: 20 ns
- Maximum repetition rate: 15 kHz (for eye safety); up to 100 kHz available
- Average power: 75 mW (for eye safety); 300 mW available

Collection

- Field Of View (FOV) : 12 mrad
- Aperture: 50 mm

Ranging

- Range : 0 m to 7644 m
- Waveform length: 6144 m max.
- Resolution: 4.7 cm to 1.5 m

Detection

- Detector: SiAPD
- ADC characteristics: 12 bits @ 100 MS/s sampling rate
- On-board averaging: 1 to 2¹⁶ pulses
- Dynamic range: 78 dB
- Max frame-rate: 20 Hz
- Sensitivity: tens of μ g/m³ @ a range of 150 m; particles properties dependent

Scanning head

- Pan angles: \pm 180°
- Tilt angles: [-31°, +83°]
- Scanning speed: 25°/s max.

Specifications Values

Footprint (excluding PTU, tripod and cables)

- Weight: 4.5 kg
- Dimensions: 218 (W) x 208 (H) x 249 (D) mm
- Power requirement: 24 V-DC @ 24 W, Operating between -20 to +40 Celsius

Communication

- GigE - Remote controllable with VNC client

Software

- Control and data analysis software running on Windows 7
- (1 USB 2.0 port , 1 Serial port and 1 Ethernet port are required to connect to the instrument)

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