AeroMap

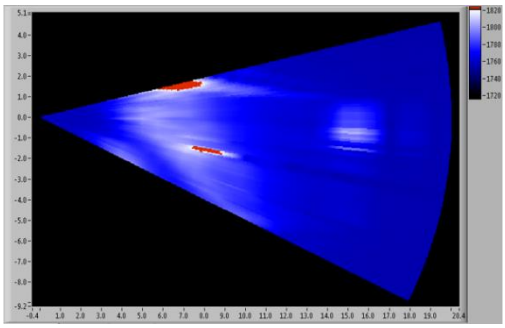
Near Infrared, Full Waveform LIDAR for Dust and Aerosol 3D Monitoring

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 of 150 m (500 ft.) with a resolution up to 20cm (typically 75cm). AeroMap delivers 2D and 3D maps of relative concentration in near real-time for a better understanding of dust generating processes.

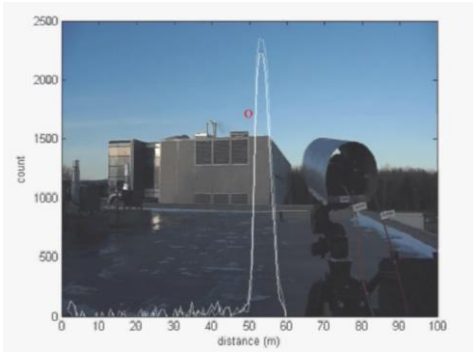
Being eye-safe, AeroMap can be easily deployed on industrial sites or cities. The AeroMap platform is currently at TRL6 and is ready for technology transfer.

AeroMap
NIR Full Waveform LIDAR

2D Map of dust concentration



LIDAR waveform showing dust emission from stack



INO OFFERS

R&D CONTRACTS — PROTOTYPING — PREPRODUCTION
SHORT-RUN PRODUCTION — TECHNOLOGY TRANSFERS

COMM-14026

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Features	Advantages	Benefits
Measures relative concentration of aerosol over a range of 150m with resolution up to 20cm (typically 75cm)	Distribution of aerosol concentration along line-of-sight	Equivalent to hundreds of point sensors located along line-of-sight
Typical limit of detection of 50µg/m^3	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°/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

APPLICATIONS

Mining
- Feedback to VOD systems
- Dust mapping and monitoring
- Dust cloud tracking
- Optimization of dust suppression techniques

Bulk material handling
- Identification of dust generating processes
- Fence line monitoring
- Cloud mapping and tracking

Construction and transportation
- Fugitive dust emission monitoring
- Dust control on unpaved roads

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Specifications	Values
Platform use	• Dust and aerosols relative concentration and mapping in air
Laser source	• Laser diode wavelength: 905 nm • Pulse energy: 3 uJ • Pulse duration: 20 ns • Maximum repetition rate: 25 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 2^{16} pulses • Dynamic range: 78 dB • Max frame-rate: 20 Hz • Sensitivity: tens of µg/m^3 @ a range of 150 m; particles properties dependent
Scanning head	• Pan angles: ±180° • Tilt angles: [-31°, +83°] • Scanning speed: 25°/s max.
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)

INO is a world-class center of expertise in industrial applications for optics and photonics, a leading LIDAR technology developer and provider of environmental monitoring solutions.

COMM-15008

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