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.
# AeroMap

**Near Infrared, Full Waveform LIDAR for Dust and Aerosol Monitoring**

<table>
<thead>
<tr>
<th>Features</th>
<th>Advantages</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measures relative concentration of aerosol over a range of 150 m with resolution up to 20 cm (typically 75 cm)</td>
<td>Distribution of aerosol concentration along line-of-sight; Ideal for fugitive emissions monitoring</td>
<td>Equivalent to hundreds of point sensors located along line-of-sight</td>
</tr>
<tr>
<td>Typical limit of detection of 50 µg/m³ @ 150 m</td>
<td>Same order of magnitude of air quality standards for total suspended particulates</td>
<td>Can be used to monitor several types of dust generating processes</td>
</tr>
<tr>
<td>Eye safe</td>
<td>Harmless to workers</td>
<td>Can be installed on industrial sites or cities</td>
</tr>
<tr>
<td>Additional context camera</td>
<td>Helps define the monitoring area. Provides pictures of “events” with concentration overlay</td>
<td>Easy deployment. Better understanding of aerosol generation processes</td>
</tr>
<tr>
<td>Pan &amp; Tilt Unit with mapping speed up to 20°/s. Acquisition speed: 2 to 10 Hz</td>
<td>Delivers 2D and 3D maps in near real-time</td>
<td>Better understanding of aerosol transport processes</td>
</tr>
<tr>
<td>On-board Processing</td>
<td>Real-time display of aerosol concentration.</td>
<td>Can be used to trigger alarms</td>
</tr>
</tbody>
</table>

## 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
# AeroMap

Near Infrared, Full Waveform LIDAR for Dust and Aerosol Monitoring

<table>
<thead>
<tr>
<th>Specifications</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Platform use</strong></td>
<td>• Dust and aerosols relative concentration and mapping in air</td>
</tr>
</tbody>
</table>
| **Laser source**     | • Laser diode wavelength: 905 nm  
• Pulse energy: 3 uJ  
• 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 µg/m³ @ 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)                                     |