

CELiS

COMPACT EYESAFE LIDAR SYSTEM

SDL has developed a novel Compact Eyesafe Lidar System (CELiS) designed to monitor airborne particulate matter (PM) emissions. It uses a 1.57µm wavelength commercial laser, an 8 inch off-axis parabolic mirror, and a 200µm diameter InGaAs avalanche photodetector (APD). The laser, mirror, and APD are mounted on a carbon fiber breadboard and housed in an environmentally-sealed housing. CELiS can operate over an 80°C temperature range with an optical path change of only 100µm.

CELiS uses SDL-developed LidarView for data collection and instrument operation. LidarView was designed as a framework that can be used with any lidar system with an appropriate plug in. It can control the lidar operation and pointing angle as well as log and preprocess lidar data.

CELiS is used by the US Army as a referee instrument to benchmark the performance response of military equipment to clouds of chemical and biological weapon simulants.

FEATURES

- Quantitative measurement of ambient PM_{2.5}, PM₁₀ or TSP concentrations at 3km (2 mile) ranges
- Eyesafe
- Real-time concentration information
- Remotely operable
- Easily transportable
- Inexpensive



Deployed CELiS system

SPECIFICATIONS

- Eyesafe laser: 1.57µm wavelength
- >1km sensing range
- < 3m range bin < 20ns pulse width or > 15MHz bandwidth
- < 1m³ size
- < 140kg
- < 1kW power consumption
- 0°C to 40°C operational temperature range

TRANSMITTER	RECEIVER	PERFORMANCE PREDICTIONS
WAVELENGTH: 1.547MM	TELESCOPE DIAMETER: 8"	SENSING RANGE-> 3KM
BEAM DIAMETER: 6"	FULL FIELD OF VIEW: 1.4MRAD	RANGE BIN (50MS/S): 3M
BEAM DIVERGENCE: 0.5MRAD	DETECTOR: INGAAS APD	

