Air Pollution Monitoring Station

raymetrics
lidar systems

Air pollution in cities and industrial areas

Air pollution is a key environmental and social issue, and, at the same time, it is a complex problem posing multiple challenges in terms of management and mitigation of harmful pollutants. Air pollutants are emitted from anthropogenic and natural sources; they may be either emitted directly (primary pollutants) or formed in the atmosphere (as secondary pollutants). They have many impacts on **health**, **ecosystems**, the **built environment** and the **climate**; they may be transported or formed over long distances; and they may affect large areas.

Types of health effects experienced by the most common pollutants at elevated levels:

Pollutant	Health effects at very high levels
NOx, SOx, O3	These gases irritate the airways of the lungs, increasing the symptoms of those suffering from lung diseases.
Particles (Aerosol detection and typing, PBL Height)	Fine particles can be carried deep into the lungs where they can cause inflammation and a worsening of heart and lung diseases.
Carbon Monoxide	This gas prevents the uptake of oxygen by the blood. This can lead to a significant reduction in the supply of oxygen to the heart, particularly in people suffering from heart disease.
Benzene	The major effect of benzene from long-term exposure is on the blood. (Long-term exposure means exposure of a year or more.) Benzene causes harmful effects on the bone marrow and can cause a decrease in red blood cells, leading to anemia.
Black carbon (BC)	A primary aerosol emitted directly at the source from incomplete combustion processes such as fossil fuel and biomass burning and therefore much atmospheric BC is of anthropogenic origin. It is small enough to be easily inhaled into the lungs and has been associated with adverse health effects.

It is estimated that 70% of the world's population will leave in urban areas by 2050

Effective air quality policies require action and cooperation at global, national and local levels, which must reach across most economic sectors and engage the public.

Target:

- Monitoring of air pollutants in cities or industrial areas (or other areas of interest).
- Assessing the impact of emissions on public health and social protection.

Our Solution for an integrated monitoring of pollutants:

- Measurement of particulate pollutants with advanced LIDAR remote sensing system.
- Measurement of gaseous pollutants by Max-DOAS remote sensing system.
- Measurement of gas and particulate pollutants by on-site methods and sampling (In situ meters).
- Atmospheric diffusion simulations.
- Automated weather observing system (AWOS).
- Modelling the dispersion of pollutants into the atmosphere. The simulation of emissions is done by combining the WRF-ARW atmospheric model to provide high-resolution grid data and the FLEXPART dispersion model to simulate the dispersion of pollutants. Considering the lifetime of each pollutant in the atmosphere, it is possible to relate the emissions to that source.

*Air pollution monitoring stations can be either at a stable point or in a mobile unit.

Raymetrics technological advantages

Raymetrics technological solution sets new standards in monitoring such emissions in cities and various industrial areas around the globe. Our solution has a clear advantage over point sampling technics due to its continuous long-range information on the concentration and distribution of emissions.

Key Benefits

- Early warning System
- Identify problems
- Engage Citizens
- Planning and forecasting
- Assessing results

CERTIFICATES

Raymetrics is to become the first atmospheric LIDAR manufacturer able to offer certifications for its products, and for their systematic uncertainties, from LiCAL/ACTRIS, according to document doi:10.5194/amt-9-4181-2016.

The company is ISO 9001:2008 certified.

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Since 2002 Raymetrics has been designing and manufacturing atmospheric remote sensing systems for meteorological and other similar applications.

Today we are the world leader in the rising wave of remote sensing technology in operational and commercial sectors such as Meteorology, Aviation, Environmental Protection, Mining, Oil & Gas and Heavy Industry.

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