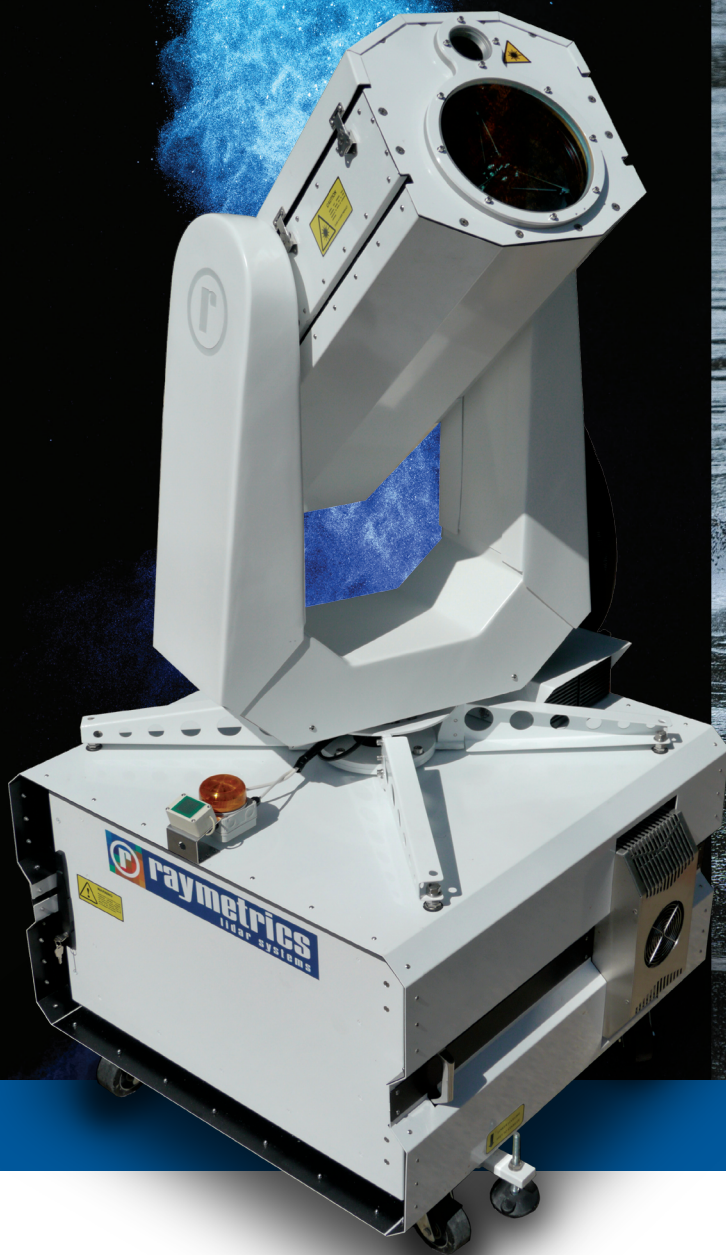


Fluorescence Lidar

For Oil Spill and Bio-Particle Detection



Oil spill and Bio-particle detection capabilities

Various sea and land accidents, impact of climate change, or even an outbreak of a biological warfare can cause disastrous economically, environmentally, and socially consequences. As a result, in the case of an oil spill accident or a growth of bio aerosols in the atmosphere, the hazard caused may be beyond repair. Therefore, early detection is a necessity and a critical action needs to be taken.

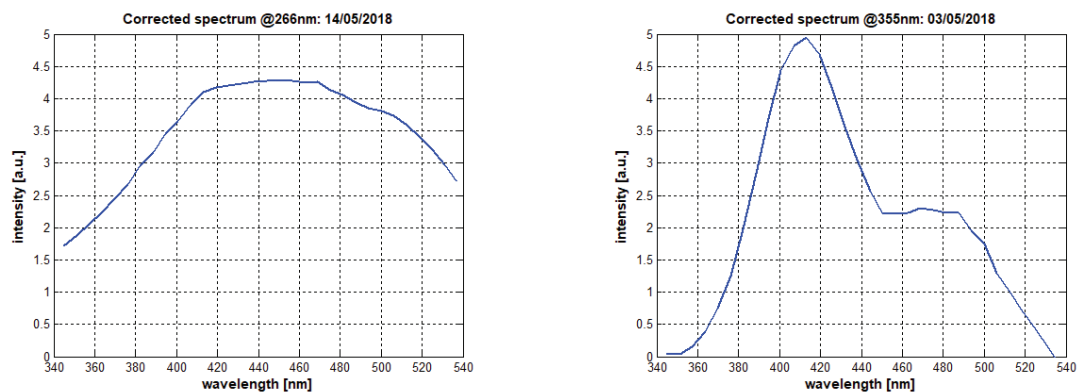
Fluorescence technology for early detection

Holistic and modern solutions are now employed by applying the Laser-Induced Fluorescence (LIF) technique.

Laser fluorosensors are active sensors that take advantage of the fact that certain compounds in petroleum oils or Bioaerosols in the atmosphere absorb ultraviolet (UV) light and become excited.

This excitation is rapidly removed through the process of fluorescence emission, primarily in the visible region of the spectrum.

Since very few other compounds show this tendency, fluorescence is a strong indication of the presence of oil or a bio-particle in the water or air respectively.



Data courtesy of S. Richardson, M. Mytilinaios, A. Papayannis LRSU, NTUA, Physics Dept from measurements made on 03/05/2018 (355nm) and 14/05/2018 (266nm).

Raymetrics Fluorescence LIDAR solution

- The system combines existing Raymetrics LIDAR technology with a specialized detector (spectrometer).
- The system emits laser radiation, which causes fluorescence of the oil (e.g. oil spill) on the surface of the water.

- By using specialized algorithms, the system can detect a thin layer of oil or a Bio-particle in the air, much difficult to detect with the naked eye.
- Even in the case that no oil is found, the system provides useful information on water quality (chlorophyll and soluble organic matter).
- In a similar way in the air, it will detect Bioaerosols (fungi spores, bacteria, viruses, pollen grains, insects etc.).

Raymetrics detection system has clear advantages over conventional techniques

- It operates day and night as it is based on its own source of radiation.
- Provides results in real time, since no sampling and time-consuming chemical analyses are required.
- Detects oil layers thin up to 1 μm and Bio-particles in the air depending on local atmospheric conditions.
- It has the capability to differentiate key types of oils or Bio-Particles that are detected.

System Suitable for

- Petrochemical/petroleum companies.
- Shipping companies.
- Coastal agencies.
- Oceanographic, Marine and other type of research institutes.

The product can be used in many different scenarios:

- In case of crisis management on a ship (e.g. port) for mapping the extent of pollution. (Positioning on the ship at an angle pointing at the surface of the water. Maximum measuring distance of 100m).
- In harbours or coasts for systematic water quality control.
- On board a regular ship for continuously mapping water quality.
- Air quality and allergenic pollen measurements.
- Biological warfare applications in case of military exercises, tactical simulations and real scenario.

CERTIFICATIONS

Raymetrics is 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.



Fluorescence Lidar

For Oil Spill and Bio-Particle Detection

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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