Climate, environment and circular economy | Environmental monitoring

ENVIRONMENTAL MONITORING

OUR SOLUTIONS

IFPEN is developing a range of solutions designed to enable industrial and environmental gas monitoring in the atmosphere, on the ground, in the soil and underground.

- Flair car: mobile multi-gas air and soil analysis station
- Flair box: autonomous mobile multi-gas air analysis station
- Flair soil: fixed multi-gas soil and underground analysis station
- Flair lab: gas laboratory for complementary studies
- Flair map: interactive data processing web app

By enabling the real-time analysis of gas present in the air or soil, Flair Suite meets a broad range of needs, such as :

- Leak detection (CO_2 / CH_4 / C_2H_6/THT)

- Air quality, odors (sulfur and ammonia particles, agricultural plant health product molecules)
- Soil respiration
- Greenhouse gas

Find out more through a video.

FLAIR SUITE: A PACKAGE OF INNOVATIONS FOR INDUSTRIAL AND ENVIRONMENTAL GAS MONITORING

The environmental monitoring of gases in the air concerns a variety of sectors: industrial sites in the broadest sense, gas storage sites (CO_2, hydrogen, methane), waste storage sites (household, radioactive), geothermal sites and gas distribution networks.
Environmental gas monitoring addresses a variety of problems (safety, economic, quality of life, environmental) in scenarios in towns and cities (gas pipelines, hydrogen stations), on industrial sites (CO_2 capture, transport and storage, defective gas storage, drilling wells in poor condition) and sometimes in more remote regions (melting permafrost, volcanic activity, landslips).

Flair car: mobile multi-gas air and soil analysis station

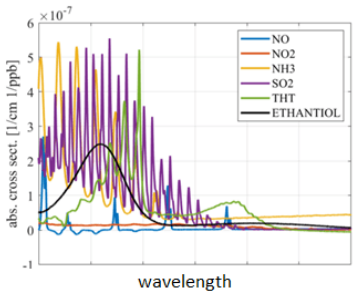
Flair car incorporates onboard gas sensors and analyzers such as the Picarro analyzer (uses infrared lasers to measure CO_2, CH_4, C_2H_6, steam, carbon 13 isotopy) to provide real-time measurements. A GPS station enables the geolocation of data and a weather station records wind details, in order to be a able to model plumes. The development objective is to enable Flair car to detect anomalies in the air composition in the soil and in ambient air and to identify the source of these emissions.

Flair car in action

Flair box: autonomous mobile multi-gas air analysis station

Flair box is based on the use of UV spectrometry to analyze ultra-low concentrations of a broad range of molecules, such as THT (tetrahydrothiophene, an odorant added to natural gas), sulfur (SO_2, etc.), ammonia, nitrogen molecules, etc. Flair box can be integrated into Flair car for mobile measurements or installed on-site for long-term measurements.

Flair box

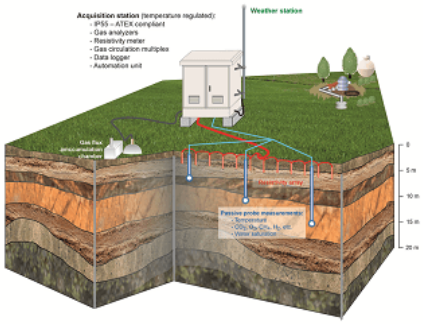


Broad spectrum UV spectrometry

Flair soil: fixed multi-gas soil and underground analysis station

Flair soil lends itself to a broad range of applications, such as the detection of gas leaks (CO_2, CH_4, C_2H_6 et THT), the behavior of gas in closed environments, the study of soil respiration at different depths, the presence of sulfur and ammonia molecules from plant health products in agricultural soil.

Underground gas behavior



Leak detection in the vadose zone - Natural CO2 emission variation: soil breathing

Flair lab: gas laboratory for complementary studies

Flair lab is made up of a vast platform of analytical resources (compositional analysis, recovery line, isotopy, rare gases, calibration of new molecules) that supplement analyses conducted in the field. Flair lab is also used to develop new methods and sensors dedicated to geothermal energy, hydrogen and odorants.

Compositional

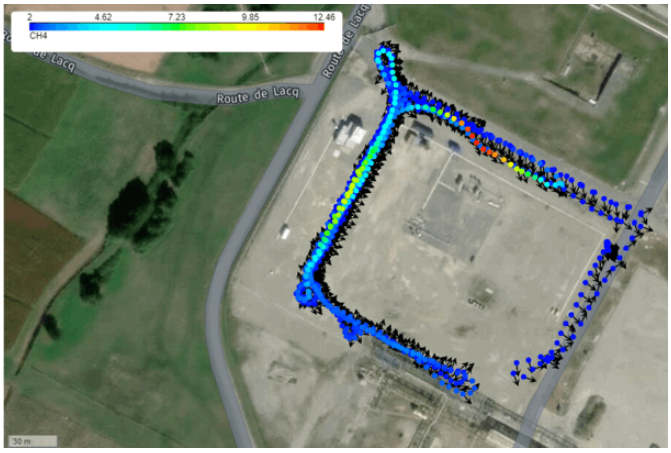
Recovery line

Isotopy

Flair map: interactive data processing web app

Flair map is designed to be the brains of the FlairSuite and uses the information provided by the different tools. Thanks to xDash technology developed by IFPEN, Flair map reproduces the data in a fun, practical way.

The main services provided by Flair map include :
- the real-time visualization of measurements obtained in the field by tools contained in the Flair Suite: maps, graphs, meteorological data, etc.;
- data management: field measurement storage and laboratory analyses;
- gas plume modeling, from source to dispersion and visual representation of calculation results;
- consultation of data at www.flairmap.com.



CH4 concentration over the Flair Car trajectory

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Our solutions

Link to the web page :