www.lim.eu

Project ScanLIM-LIBS (ver.2Q 2019)

The present version of our **ScanLIM** system allows the user to create a virtual "core-store" of high quality, true-colour and correctly scaled digital images, reproducing precisely all the visual elements of the core samples themselves. The scans can be carried out under natural light or UV.

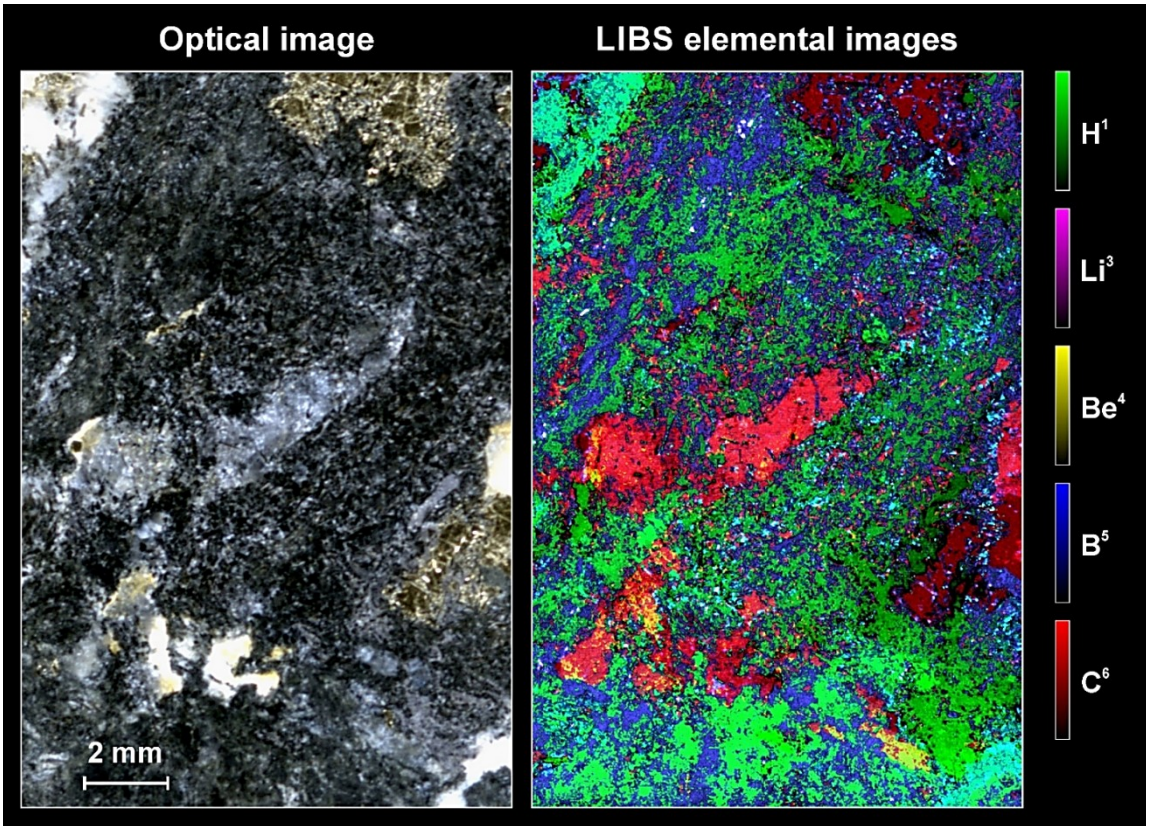
Borehole information is included in the data files in order to ensure systematic archiving.

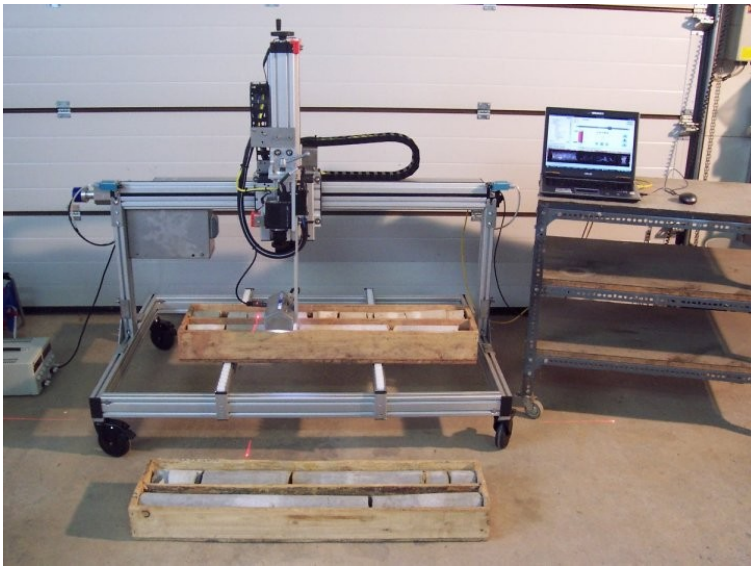
The system is transported in kit form and can be assembled and operational on site within 30 minutes.

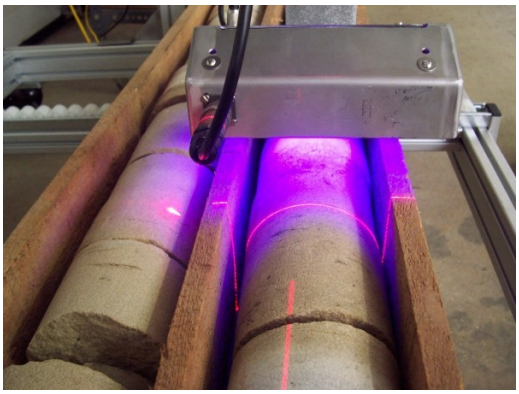
This site-based solution is dedicated to obtaining high-quality digital core images at, or as close as possible to, the borehole location.

For a mining company, the principal objective is to establish the economic value of its ore body through an as complete as possible understanding of the geological context.

With the **ScanLIM-LIBS** project, our aim is to obtain, from a single solution, geological information from a high-precision optical scan of a core sample by means of a triple-CCD 2048 pixel linear camera (with 1 pixel equating to a surface of 55 x 55 µm), as well as grade values through a system based on miniaturised LIBS (*L*aser *I*nduced *B*reakdown *S*pectroscopy) technology.







The principal mining industry sector we are targetting with this product is exploration for base metals (Cu/Pb/Zn/Sb) where grades are in excess of 0.1 %.

The **ScanLIM-LIBS** system is intended based at the exploration location and provide high-precision digitised images and grade results directly from the core samples on site.

Benefits will include time gains for decision-making and reduced costs for sample transport between site and laboratory.

Currently, for on-site approximate grade values, base-metals explorers often turn to portable systems based on XRF technology.

But, for different reasons linked to the XRF technology itself, or its implementation in hand-held “pistol” type devices, the results obtained can be unsatisfactory or do not meet expectations.

In response to these perceived shortcomings, the **ScanLIM-LIBS** will integrate an innovative spectroscopic methodology based on LIBS technology.

LIBS – an innovative technology for elementary analysis:

The LIBS methodology is based on the spectroscopic analysis of a plasma generated by the impact of a laser light pulse on the sample under study which, through specific optical responses, gives information on the elements present in the sample. By extracting individual elementary responses (ionic and atomic signatures) from the overall spectral signal, the elements present can be identified and their relative concentrations determined.

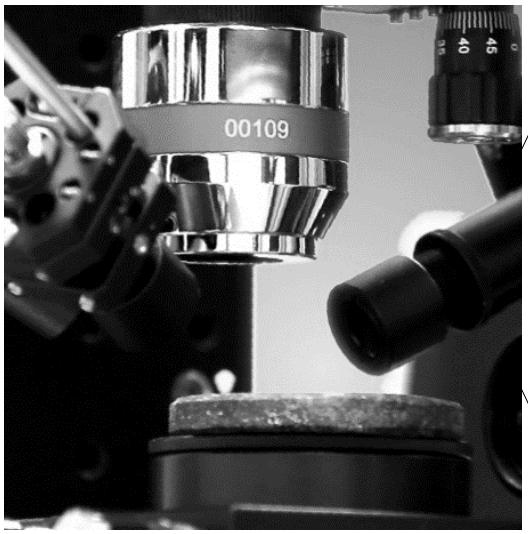
Advantages

Speed of analysis

Detection of light elements

Sensitivity

All-optical device



Specifications

Duration of the measure
Few ms

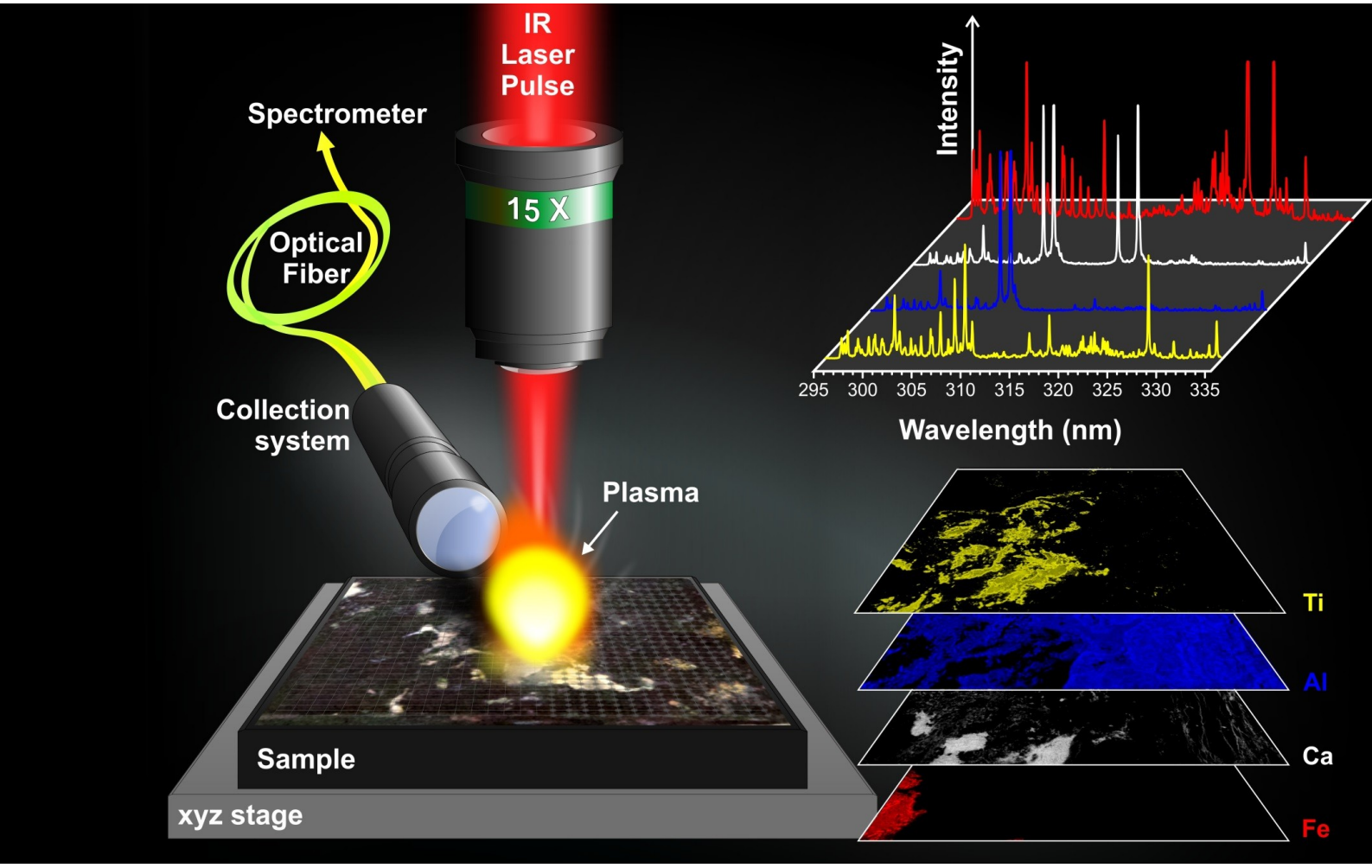
Multi-elemental analysis
Metals and light elements

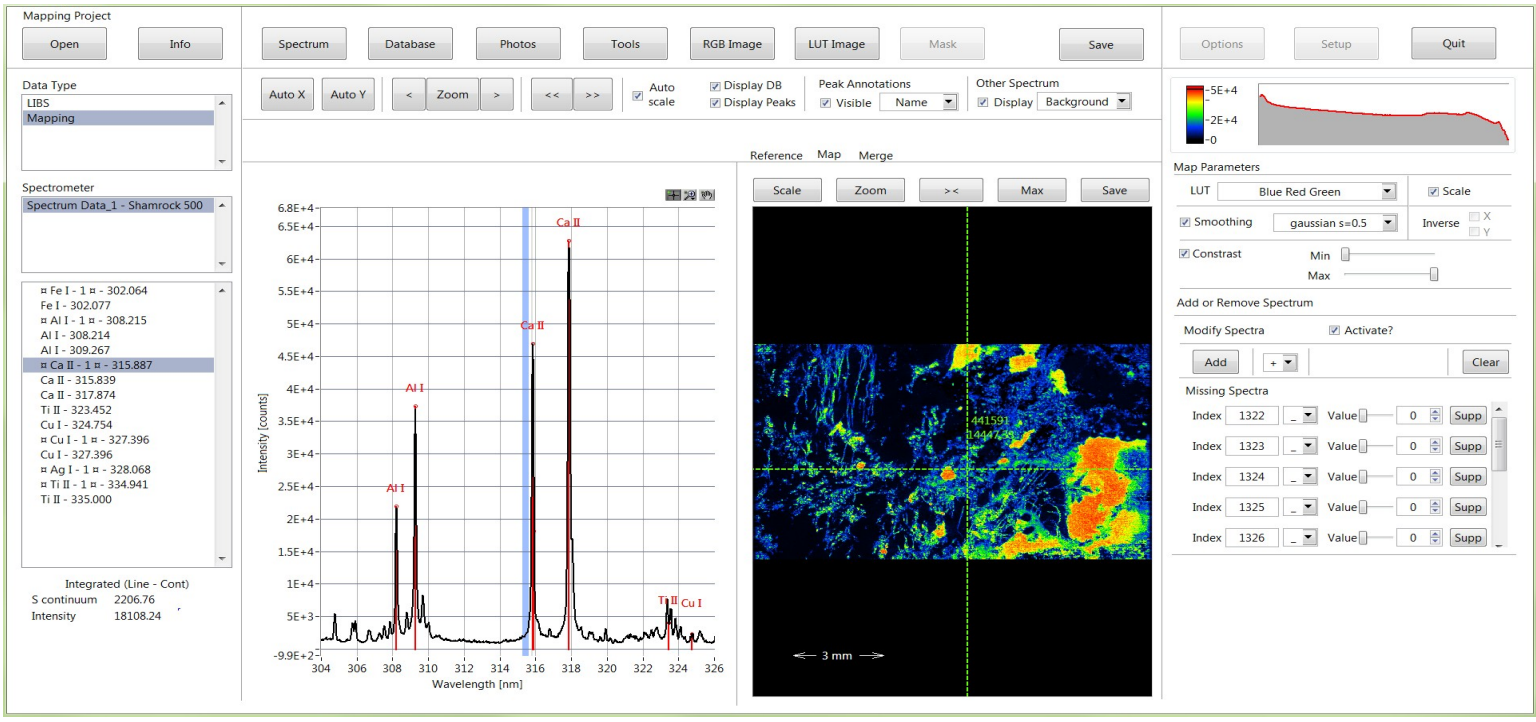
Sensitivity
LoD could equal the µg/g

Dynamic range of detection
From µg/g without maximum

Uncertainty of measurement
≈ 10 %

Spatial resolution
10 – 50 µm


IR
Laser
Pulse
Spectrometer
15 X
Optical
Fiber
Collection
system
Plasma
Sample
xyz stage
Intensity
295 300 305 310 315 320 325 330 335
Wavelength (nm)
Ti
Al
Ca
Fe


Mapping Project
Open
Info
Spectrum
Database
Photos
Tools
RGB Image
LUT Image
Mask
Save
Options
Setup
Quit
Data Type
LIBS
Mapping
Spectrometer
Spectrum Data_1 - Shamrock 500
Auto X
Auto Y
Zoom
Auto scale
Display DB
Display Peaks
Peak Annotations
Visible
Name
Other Spectrum
Display
Background
Reference
Map
Merge
Scale
Zoom
Max
Save
Fe I - 1 ¤ - 302.064
Fe I - 302.077
Al I - 1 ¤ - 308.215
Al I - 308.214
Al I - 309.267
Ca II - 1 ¤ - 315.887
Ca II - 315.839
Ca II - 317.874
Ti II - 323.452
Cu I - 324.754
Cu I - 1 ¤ - 327.396
Cu I - 327.396
Ag I - 1 ¤ - 328.068
Ti II - 1 ¤ - 334.941
Ti II - 335.000
Integrated (Line - Cont)
S continuum 2206.76
Intensity 18108.24
Intensity [counts]
Wavelength [nm]
Ca II
Al I
Ti II
Cu I
3 mm
Map Parameters
LUT
Blue Red Green
Smoothing
gaussian s=0.5
Inverse
Constrast
Min
Max
Add or Remove Spectrum
Modify Spectra
Activate?
Add
Clear
Missing Spectra
Index
Value
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