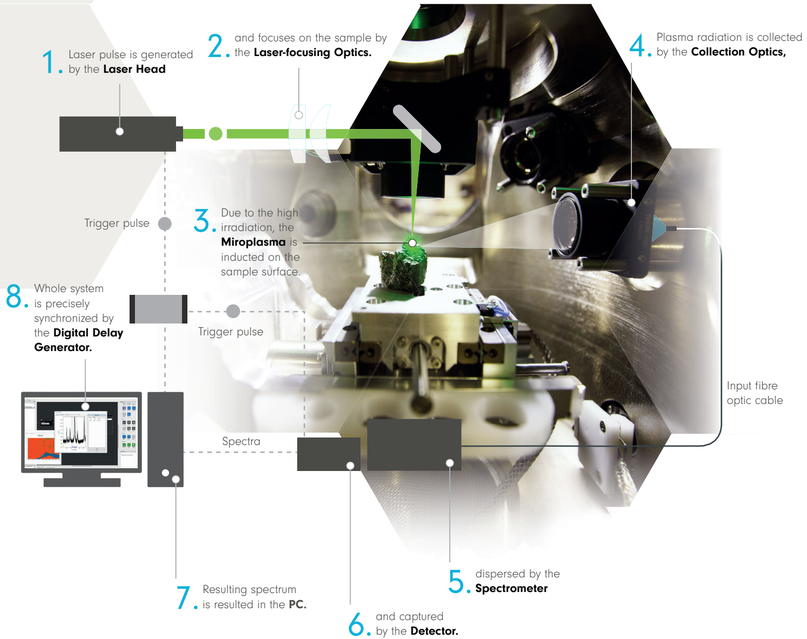
LIBS TECHNOLOGY IN BRIEF

LIBS (Laser-Induced Breakdown Spectroscopy) is a modern analytic technique, which utilizes a laser pulse for fast determination of elemental composition of the sample. It is an effective combination of laser ablation with an atomic emission spectroscopy.



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CEITEC LASER SPECTROSCOPY

LASER-INDUCED BREAKDOWN SPECTROSCOPY

OUR VISION

Our vision is to transfer high-end science to daily routine.

OUR MISION

Our mission is to bridge the gap between technical and bio-sciences, to develop state-of-the-art instrumentation and provide professional analytical services.

FOCUS OF THE LABORATORY

Basic and applied research
In wide range of applications of plasma physics and analytical chemistry.

Instrumentation development
Laser-ablation based analytical systems for high-end scientific or in-line industrial purposes.

Contracted research
Services for external customers, sample handling with bulk and surface elemental analysis.

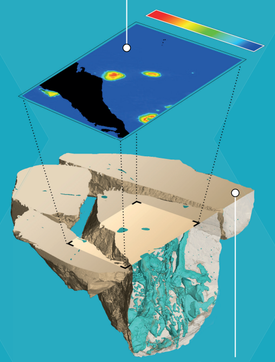
ADVANTAGES OF LIBS

SPEED
LIBS provides real-time response. Repetition rate reaches kHz, yielding more than hundreds of spectra per second.

RESOURCE-EFFICIENCY
Reasonable power and minimum carrier gas consumption (Ar, He)

ELEMENTS COVERAGE
Most of the chemical elements can be detected, including the light ones (Be, Li, C, Na, Mg, ...).

Elemental map of **Pb and its distribution** in galena mineral



Galena section

SPATIAL RESOLUTION
Small spot of the analysis enables chemical mapping with the spatial resolution of 10-100 microns.

IN-SITU DETECTION
Flexibility and robustness of LIBS enables development of hand-held compact system (detection in direct contact) and sophisticated in-line and stand-off systems (detection at a distance)

DETECTION CAPABILITY
Simultanous detection of all elements present with detection limits on 1-100 ppm level.

APPLICATIONS

Qualitative and quantitative analysis
- Estimating the composition of a sample
- **Example of application:** detection of C in steel, Cl in concrete, traces of toxic elements in materials

Sorting of materials
- Classification of samples based on their characteristic spectra
- **Examples of application:** Mining and alloy sorting

Depth profiling and 3D mapping
- Selective ablation of consecutive layers
- **Example of application:** Zn coated steel, archeological samples

Machine learning
- Data science and advanced matemathical models
- Improved quantitative analysis and sorting