

ADVANCED CHEMICAL PUNCTUAL ANALYSES AND IMAGING

Innovations and Benefits - Chemical punctual analyses and imaging by way of integrated remote LIBS/LIF/RAMAN spectroscopic sensors without sample preparation and manipulation.

Specifically, the chemical elemental analysis can be contact-free and micro-destructive, in solid/liquid samples, and the remote application at several metres distance is possible even on dangerous samples (explosives, pollutants).

The detection is based on the presence of elements in characteristic relationships (LIBS technique) and functional groups associated with specific electron (LIF) and vibrational (Raman) transitions.

Uses - Contact - and sample-taking-free analysis of the composition of unknown samples. Geology: prospecting to search for minerals and hydrocarbons. In-line quality control for industrial products (metals and alloys).

Past and Present Activities - Remote explosive detection system under the EU EDEN project for Security. Collaborations with IPAC (A) and vH&S (D). Development of software for automated detection and quantification of different substances. Applications in hostile environment (industrial furnaces). Collaborations with LG. Sorting of minerals, plastics and metals for resource search and recycling (E-Waste Management). Collaborations with BMCR-Bologna. Outdoor applications on probes (geological prospecting and underwater and planetary explorations in the aerospace sector). Collaborations with SLD-Smart Light Device – Scotland. Biomedical applications for diagnostics on in-vitro and in-vivo tissues. Collaborations with Quanta System and EKSMA (LT).

