

Remote analysis by laser-induced breakdown spectroscopy

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The dissertation to be presented focuses mainly on development of methods for *stand-off* LIBS in field of archaeology and cultural heritage protection. The work has been done in cooperation with Institute of Physical Engineering, Faculty of Mechanical Engineering, Brno University of Technology, where *stand-off* LIBS device is being developed.

The research was focused on building materials since field-deployable LIBS setup represents a great advantage in this area. LIBS spectra were treated using advanced chemometrics with the aim of finding the best method for classification of materials or different types of the same material. Multivariate methods for dimension reduction like PCA and Sammon mapping were tested first. Then various supervised and unsupervised methods of pattern recognition for classification were used. The spectra were also investigated in relation with differences in plasma conditions or measuring parameters while measuring various types of materials.