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Fast quantitative elemental mapping of highly inhomogeneous materials by micro-Laser-Induced Breakdown Spectroscopy

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Abstract

In this work, a fast method for obtaining a quantitative elemental mapping of highly inhomogeneous samples by μ -LIBS maps is proposed. The method, transportable and cheap, allows the analysis of large maps through the use of a Self-Organizing Map clustering method coupled to Calibration-Free LIBS for quantification of cluster prototypes. The method proposed has been verified on heterogeneous materials such historical lime mortars but it can be easily applied to a larger class of inhomogeneous materials for very different applications (modern building materials, biological samples, industrial materials, etc.).

Keywords: LIBS, Elemental Mapping, Calibration-Free LIBS, Self-Organizing Maps, Mortars

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