

Laser Induced Breakdown Spectroscopy (LIBS)

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Laser Induced Breakdown Spectroscopy (LIBS) is a novel spectroscopy method that provides real-time and direct elemental analysis of sample materials in solid, liquid and gaseous forms. A focused laser produces a plasma on the sample surface, which is then optically analyzed to yield component elemental composition and concentration. To improve the detection sensitivity of the LIBS technique, dual temporally spaced laser excitation pulses are often employed. During this talk we report on our efforts to gain a better understanding of the plasma physics involved in the double pulse LIBS processes with combinations of femtosecond and nanosecond lasers sources. In addition, recent concerns about homeland security and terrorist threat analysis have lead to a national need in the development of capable remote sensing technologies. We will present an overview of use of LIBS and other techniques to develop optical based systems for the remote detection of hazardous materials.