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Temporal Evaluation of Femtosecond Laser Induced Plasma for Spectrochemical Analysis of Soils by LIBS

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In the last years ~~the~~ laser induced breakdown spectroscopy (LIBS) technique has been considered a very promising analytical tool for qualitative or quantitative chemical analysis. However, there is a lack of well-established methods when compared to the most used atomic spectrometry techniques such as GFAAS (Graphite Furnace Atomic Absorption Spectrometry), ICP-OES (Inductively Coupled Plasma Optical Emission Spectrometry) and FAAS (Flame Atomic Absorption Spectrometry). In this way, the evaluation of processes involved in laser-plasma interaction is still necessary for LIBS development. This work presents studies on time-resolved femtosecond laser induced breakdown spectroscopy in soil target at air atmospheric pressure. The temporal evolution of plasma parameters such as electron number density and excitation temperature ~~was~~ were evaluated. The spectra from atomic and ionic lines were observed after different delay times. The ~~better~~ best gate delays, considering the signal-to-background ratio, were obtained in **50** and **110 ns** for ionic and atomic lines, respectively.