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Over recent years, the LIBS (Laser-Induced Breakdown Spectroscopy) technique has become widely used in the field of spectrochemical analysis, with applications in numerous fields. Conventional single-pulse LIBS consists in focusing a moderate-energy pulsed laser (usually tens to hundreds of millijoules per pulse) onto a target material to vaporize a small amount of the sample, thus generating a hot, transient plasma. Qualitative and quantitative analytical information is then obtained thanks to the spectrally resolved study of the emitted radiation from this plasma. Compared to other existing analytical techniques, LIBS offers major advantages (little or no sample preparation, in-situ real-time measurements, and, in contrast to almost any other method, stand-off (remote) analysis), but usually suffers from a relatively lower sensitivity. Our work is addressing this issue. Indeed, two approaches involving a second laser pulse were investigated in order to enhance the intensity of the spectral lines emitted by trace elements, namely LIBS-LIF (LIBS coupled with Laser Induced Fluorescence) and RELIBS (Resonance Enhanced LIBS). Both of them rely on a spectrally-selective reexcitation of specific elements in the pre-formed plasma. The former consists in inducing a specific transition of the trace element under investigation, which leads to a dramatically improved fluorescence, and the latter is based on the excitation of the most abundant element, which results in an efficient re-heating of the plasma through collisional energy transfers. This presentation will review some of the major experimental results obtained so far, and propose a discussion on the processes involved in both approaches.