## Differential laser-matter interaction in the ablation of solid samples with laser pulses in the interval between 35 fs – 4 ps.

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Our communication is focused on the influence of the pulse width in the laser-matter interaction during laser ablation of solid materials. The experiments were performed with an 80 MHz, 100 nJ, 400 fs Ti-Saphire oscillator, amplified to produce an output of 3,5 mJ at 35 fs and a maximum repletion rate of 1 KHz. Modifications in the stretcher-compressor have allowed the continuous selection of amplified pulses in the range between 35 fs to 4 ps. The pulses are subjected to measurements in the autocorrelation, spectral bandwidth and energy per pulse. A 0.5 m focal-length spectrograph fitted with an intensified CCD or fast single-channel detectors is used to determine the time constants, to establish the fluence threshold, and to record multichannel spectra from the generated plasmas. Additionally, morphological characterization making use of optical and electron microscopy were performed.

The effect of the longer laser pulses in the laser-matter interaction - particularly in the extension of the heat-affected zone - and its implication in depth-profiling studies was also checked. For such purpose, a layered sample with a defined structure was analyzed by laser-induced breakdown spectroscopy under different pulse widths conditions. The effect on the averaged ablation rate, depth resolution and layer mixing will be commented.