CHARACTERIZATION OF PLASMA SHOCK WAVES AND CAVITATION BUBBLES PRODUCED BY A HIGH-ENERGY LASER PULSE THROUGH OPTICAL AND ELECTRONIC TECHNIQUES

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Laser shock peening (LSP) is an established mechanical surface treatment technology. In the last years, some works have presented satisfactory results in the characterization of shock waves and plasma produced by high-energy laser pulses [1-3]. These results contribute for the understanding of the LSP process. In this work, we present experimental results of the characterization of the plasma shock wave and cavitation bubbles produced by a high-energy laser pulse using optical beam deflection system [4], piezoelectric sensors (PZT) and strain gauges [5]. The experimental process was carried out using Q-switched Nd:YAG laser, operated at two wavelength of 532 nm and 1064 nm with an energy of 0.5 and 1 J/pulse in single shot. These results can be applied to calculate some parameters used in the Laser Shock Processing simulation process.

Fig. 1. (a) Experimental setup of electronics technics (PZT and strain gauges). (b) Aluminium sample with PZT and strain gauge sensors.