

## DESIGN AND CONSTRUCTION OF A PORTABLE PULSED LASER TYPE YAG:ND<sup>+++</sup> FOR LIBS APPLICATIONS

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### ABSTRACT

This article describes the design and construction of a portable, pulsed laser of type YAG:Nd<sup>+++</sup> for LIBS applications. The power source of the system is based on a voltage block created by a voltage tripler with six 330  $\mu$ F/ 200 V capacitors, 4 rechargeable Li batteries and a 12VDC/220 VAC inverter. The instrument is equipped with a digital electronic control system that permits variations in the frequency and energy of the laser pulses. Finally, the resonance cavity is made with a YAG:Nd<sup>+++</sup> crystal, a xenon lamp, two dielectric mirrors and a LiF crystal that modulates a passive Q-switch. The time between pulses varies between 4 and 7 seconds while the energy stored in the potential block ranges between 14 and 17 Joules. The wavelength emitted by the laser is 1064 nm (NIR). The entire instrument weighs 3 kg and measures 20x24x10 cm.

**Keywords:** Pulsed Laser, Opto-Electronic, Lasers, LIBS.