THE ABSTRACT BOOK

MICROSCOPY AT THE FRONTIERS OF SCIENCE, THE SECOND JOINT MEETING OF THE TWO IBERIAN MICROSCOPY SOCIETIES, COVERS ALL ASPECTS OF MICROSCOPY APPLIED TO LIFE SCIENCES, MATERIALS SCIENCES AND ALL OTHER FIELDS OF SCIENCES IN WHICH MICROSCOPY HAS A FUNDAMENTAL ROLE.

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MICROSCOPY
AT THE FRONTIERS OF SCIENCE

MSO40 A MICROSCOPY STUDY OF GERMANIUM NANOPARTICLES PRODUCED BY PULSED LASER DEPOSITION

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Semiconductor nanoparticles (NPs) are of great interest for multiple applications in the fields of photonics, optoelectronics, photovoltaics and biomedicine [1]. The ability to manage properly the size distribution and density in the fabrication process is of crucial relevance. In the literature, it can be found a large number of strategies for NPs production, including physical vapour deposition (PVD) methods. The main advantage of this technique, with respect to others, is the possibility to produce NPs in a free-contaminant inert atmosphere. In particular, pulsed laser deposition (PLD) technique is a versatile technique for producing NPs at room temperature (RT) when an inert gas atmosphere is introduced in the growth chamber [2]. Shadow mask or eclipse method has been demonstrated as an excellent approach for NPs size filtering, avoiding direct deposition of micron-sized particles usually produced in the ablation process [3].
In the nanometer scale, high-resolution microscopy techniques are essential to evaluate NPs sizes and density among other features, in order to optimize the NPs production process. In this work, we present scanning electron microscopy (SEM) and atomic force microscopy (AFM) studies of NP films produced by PLD in an inert Argon gas atmosphere and under different deposition conditions, namely gas pressure, energy density and laser pulse frequency. We have combined shadow mask and off-axis configurations for NPs deposition. It is shown that, both NPs sizes and their distribution can be controlled precisely using adequate deposition conditions. WSxM software was used for AFM image processing and analysis [4].

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