



SEMINARIO

MATERIALS CHARACTERIZATION AND MODIFICATION USING ION BEAMS

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In this seminar, the use of ion beams for materials characterization and modification will be presented and discussed. Different characterization techniques that make use of ion beams will be introduced, with main focus on Rutherford Backscattering Spectrometry/Channelling (RBS/C), ionoconductivity and ionoluminescence. RBS/C allows the quantification of structural defects, which could be intrinsic or created by implantation or irradiation, with depth resolution. A specific case study on doping $\beta\text{-Ga}_2\text{O}_3$ with Europium by ion implantation will be presented. Using RBS/C together with other complementary characterization techniques a correlation between the density of defects and the optical activation of implanted Eu in $\beta\text{-Ga}_2\text{O}_3$ was found.

In order to understand better the effect of radiation on electrical and optical properties, a new setup was installed at Campus Tecnológico e Nuclear (CTN) to exploit the possibility of using different techniques simultaneously and in real time during the irradiation. This setup uses a microprobe to focus the beam of alpha particles or protons of up to 2.5 MeV produced by a Van de Graaff generator, allowing studies with high lateral and depth resolution. One example of what can be studied using this setup is the influence of defects on the electrical and optical properties by the relation between the conductivity (Ionoconductivity) and the luminescence (Ionoluminescence) induced by ion irradiation.