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Thesis Defense

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Highly Crystallized Zinc Oxide Thin Films Grown By Pulsed Laser Deposition

by

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This thesis deals with the synthesis of zinc oxide (ZnO) thin films by the pulsed laser deposition technique (PLD). Since the chemical and physical properties of ZnO are highly dependent on the growth process conditions, special emphasis was placed on the effect of the various deposition parameters on the composition, structural, and morphological properties of the deposited thin films with the search for the optimal conditions. For this, the effect of the substrate temperature, background oxygen pressure and laser power, including laser energy and repetition rate were specifically investigated. The crystalline quality, elemental composition and morphology of the resulting thin films were studied by *X-Ray Diffraction (XRD)*, *Energy Dispersive X-Ray Spectroscopy (EDX)* and *Scanning Electron Microscopy (SEM)*, respectively. In parallel, their optical properties were determined by near infrared visible and ultra-violet (UV-VIS-NIR) spectroscopy, from which the experimental data collected and a corrected Kramers-Kronig model the optical dielectric function of the deposited ZnO thin films was extracted, and their band gap energy was calculated. Moreover, the deposition on large area substrates was also investigated to study the uniformity of the deposited ZnO thin film over the full area.

Date: Wednesday, March 8, 2017

Place: Rm. 310, Physics

Time: 4:30 p.m.