

## VII Leopoldo García-Colín Mexican Meeting on Mathematical and Experimental Physics



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### **ROSALBA CASTAÑEDA: Synthesis of lead free electroceramics thin films by PLD.**

*Thursday, 20 February 2020 12:30 (30 minutes)*

Lead-free piezoelectric materials were developed during the second half of the past century, among them, the potassium sodium niobate ( $\text{K}_{0.5}\text{Na}_{0.5}\text{NbO}_3$  (KNN), KNN-based ferroelectrics and based ferroelectrics in Titanates of Barium ( $\text{BaTiO}_3$ ), are considered a promising lead-free materials alternative to  $\text{Pb}(\text{Zr,Ti})\text{O}_3$  (PZT,) particularly the KNN by its high Curie temperature ( $T_c$ ). Using PLD (pulsed laser deposition) we grown thin films of  $(\text{K}_{0.5}\text{Na}_{0.5})\text{NbO}_3$  (KNN) and  $\text{Ba}_{1-x}\text{Ca}_x\text{Ti}_{0.9}\text{Zr}_{0.1}\text{O}_3$  (BCTZ). KNN thin films were deposited on Pt/TiO<sub>2</sub>/SiO<sub>2</sub>/Si substrates at different deposition conditions (substrates temperature, oxygen pressure and laser fluence). BCTZ were deposited on Si and glass substrates at different conditions. The morphology of all the films were examined by scanning electronic microscope (SEM). The structural analysis of the films was performed by Pulsed Laser Photoacoustic (PLPA) technique, this method was employed to identify the structural phases and structural changes with the increase in temperature. Furthermore, X-ray Diffraction Spectroscopy (XRD), X-ray Photoelectron Spectroscopy (XPS) and Raman Spectroscopy were performed to prove the PLPA results. The PLPA analysis shows tetragonal structural phase in KNN thin films, and the orthorhombic and tetragonal structural phases in the BCTZ thin films.

**Session Classification:** PLENARY TALKS

**Track Classification:** SYMPOSIUM ON LASER ABLATION