

Abstract Submitted  
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**Current-induced and Photoinduced Effects in Annealed  $\text{Bi}_{1-x}\text{Ca}_x\text{MnO}_3$  Thin Films**<sup>1</sup>

VERA SMOLYANINOVA, K. KARKI, RAJESWARI KOLAGANI, G. YONG, R. KENNEDY, Towson University — Doped rare-earth manganese oxides exhibit a wide variety of physical phenomena. Application of magnetic field, electric field, or electromagnetic wave irradiation drastically modifies electrical conductivity and refraction index of these materials. A photoinduced and current-induced insulator to metal transition in charge-ordered (CO) manganese oxides is especially interesting from the point of view of photonic and opto-electronic device development. We have found that 50 nm  $\text{Bi}_{0.4}\text{Ca}_{0.6}\text{MnO}_3$  thin film grown on  $\text{NdCaAlO}_4$  substrate is very susceptible to increase of current and illumination with laser light ( $\lambda \sim 500$  nm) [1]. Application of these stimuli partially destroys CO and produces charge-disordered conductive phase. Combined application of illumination and current completely destroys the charge ordering in this material, while the application of one of these factors separately is not sufficient to produce such effect. Current-induced and photoinduced properties of the  $\text{Bi}_{0.4}\text{Ca}_{0.6}\text{MnO}_3$  thin films grown on different substrates will also be presented and current-voltage characteristics will be discussed. [1] V. N. Smolyaninova et al., Phys. Rev. B 76, 104423 (2007).

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