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Light-induced Resistance Changes in Epitaxial Thin Films of Hole Doped Rare Earth Manganites RAJESWARI KOLAGANI, GRACE YONG, VERA SMOLYANINOVA, DAVID SCHAEFER, DOU DOU QIAN, GILLES DONGMO-MOMO, Towson University, CHRISTIE NELSON, Brookhaven National Laboratory, CHUHEE KWON, California State University-Long Beach — We observe light induced resistance changes in oxygen deficient $La_{0.67}Ba_{0.33}MnO_{3-y}$(LBMO) thin films and compressively strained $La_{0.67}Ca_{0.33}MnO_3$ (LCMO) thin films grown by Pulsed Laser Deposition. LBMO thin films grown under low oxygen pressures are insulating down to 140 K where we observe a hump in resistivity reminiscent of transition to a ferromagnetic metallic state, immediately followed by an upturn in resistivity. Illumination of these films by continuous Argon laser causes a pronounced decrease in resistivity over a broad temperature range. In compressively strained LCMO thin films which are insulating, we observe a similar suppression of resistivity under illumination at temperatures below 250 K (the temperature range of the metal insulator transition in the unstrained films). Both lattice mismatch strain and oxygen deficiency are known to suppress the insulator-metal transition and enhance charge and orbital ordering in manganite materials. Radiation over a broad range of wavelength is known to destroy charge/orbital ordering. We will discuss the origin of the observed photoconductivity and the possible role of charge/orbital ordering .

Rajeswari Kolagani
Towson University

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