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Non-bolometric Photoresponse in Thin Films of Perovskite Manganites M.RAJ RAJESWARI, MASON OVERBY, VERA SMOLYANINOVA, DAVID COX, ANTHONY DAVIDSON, Towson University — We have studied the light induced resistance changes (photoresponse) in the thin films of several manganite systems that undergo insulator- metal transition. While the photoresponse in materials such as La $_{1-x}$ Ca $_{x}$ MnO_3 is purely thermal (bolometric) in origin, we find that photoresponse of low Tc manganites that exhibit first order percolative transitions (e.g.$La_{0.7-y}Pr_yCaMnO_3$) is remarkably different. In these latter type of materials, we observe photoresponse that cannot be accounted for by thermal effects alone. The temperature dependence of the non-bolometric response suggests a light-induced reduction in the resistivity. We believe that the origin of the non-bolometric response is linked to the co-existence of the charge ordered insulating (COI) regions with the ferromagnetic metallic regions (FMM) in the low T_c materials. Reduction in resistivity could arise due to the radiation induced switching of the COI regions into the FMM state. We will discuss the details of the non-bolometric response including its dependence on temperature, radiation intensity and frequency, its relaxational dynamics and the possible correlation with magnetoresistance. This work is supported by the NSF grants DMR-0116619 and DMR- 0348939, Undergraduate Research Grant from the College of Science and Mathematics, Towson University and the Federal work- study support for M. Overby.

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