

Abstract Submitted
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Nonthermal **Photore-**
sponse in Epitaxial Thin Films of (La,Pr).67Ca.33MnO4: Correlation
with Non-ohmic Electrical Transport and Magnetoresistance ANTHONY
DAVIDSON III, RAJESWARI KOLAGANI, GRACE YONG, VERA SMOLYANI-
NOVA, Towson University, MASON OVERBY, Towson University (Currently at
Purdue University) — We have recently observed a non-thermal component of light
induced resistance change in the vicinity of the insulator-metal transition, in epi-
taxial thin films of the CMR manganite material (La,Pr).67Ca.33MnO4 (LPCMO).
LPCMO is known to have the co-existence of insulating and metallic regions. On
cooling, the metallic regions grow at the expense of the insulating regions, giving rise
to a percolative insulator-metal transition. Our results indicate that light may cause
electronic changes in the insulating regions thus decreasing the electrical resistance.
We will present our studies of the photoresponse and the correlation of the observed
non-thermal photoresponse with magnetoresistance as well as current-voltage (I-V)
characteristics. I-V measurements show that there is a current induced change in
resistance which is not due to the joule heating effects. This effect is only seen in
the metal-insulator transition range of the samples, similar to the nonthermal pho-
toresponse, suggesting a common origin for these two phenomena. The effects of
magnetic field however are seen to be distinct. A large magnetoresistance is seen
at lower temperatures where the light and current induced effects are absent, thus
suggesting a very different physical origin for the magnetoresistance.

Anthony Davidson III
Towson University

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