Abstract Submitted
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Plasmon Enhancement of Photoinduced Resistivity Changes in $\mathbf{Bi_{1-x}Ca_xMnO_3}$ Thin Films[1] VERA SMOLYANINOVA, E. TALANOVA, RAJESWARI KOLAGANI, G. YONG, R. KENNEDY, M. STEGER, K. WALL, Towson University — Doped rare-earth manganese oxides (manganites) exhibit a wide variety of physical phenomena due to complex interplay of electronic, magnetic, orbital, and structural degrees of freedom and their sensitivity to external fields. A photoinduced insulator to conductor transition in charge-ordered manganites is especially interesting from the point of view of creating photonic devices. Thin films of $Bi_{0.4}Ca_{0.6}MnO_3$ exhibit large photoinduced resistivity changes associated with melting of the charge ordering by visible light [1]. We have found a considerable increase of the photoinduced resistivity changes in the $Bi_{0.4}Ca_{0.6}MnO_3$ thin film after depositing metal nanoparticles on the surface. This increase can be explained by enhancement of local electromagnetic field in the vicinity of the gold nanoparticle due to the plasmon resonance. The changes in lifetime of the photoinduced state will be reported, and the possible origin of these effects will be discussed.
[1] V. N. Smolyaninova at al., Appl. Phys. Lett. 86, 071922 (2005).

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