Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Development of Uncooled Micro-bolometer Arrays Based on Hole-doped Rare-Earth Manganites E. KEVIN TANYI, GRACE YONG, CAMRON KESHAVARZ, PRAKASH SHARMA, CHRISTOPHER RUBIN, RAJESWARI KOLAGANI, Towson Unviersity, STEVEN GROSS[1], Triton Services Inc. — Material properties indicate that rare earth manganites have a competitive advantage over VO_x which is a material commonly employed as bolometric sensors in state of the art uncooled imaging arrays. We will present the results of our work on developing manganite thin films for uncooled micro-bolometer arrays. By fine tuning the cation composition and stoichiometry, we have identified material compositions suitable for uncooled bolometer operation and developed thin films of these materials by Pulsed Laser Deposition (PLD) on Si. For hetero-epitaxy on Si, we employ lattice engineering schemes to circumvent problems such as chemical incompatibility and amorphization of the substrate surface due to the native oxide. We are in the process of fabricating single test bolometers and micro-bolometer arrays. We will discuss the results of materials development and device fabrication efforts and will present performance parameters and estimated figures of merit for test bolometers. We will also discuss efforts towards understanding and alleviating material problems such as the residual stresses in the thin film heterostructures which are of critical importance for the fabrication of suspended microstructures.

[1]We acknowledge support from the NSF grant ECCS 1128586 at Towson University.

E. Kevin Tanyi
Towson Unviersity

Date submitted: 17 Nov 2012 Electronic form version 1.4