Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Growth parameter control toward mobility enchancement in doped $BaSnO_3$ thin films PRASTUTI SINGH, Stanford University, ADRIAN SWARTZ, Stanford University, Geballe Laboratory for Advanced Materials, Stanford Institute for Materials and Energy Sciences, DI LU, Stanford University, Stanford Institute for Materials and Energy Sciences, KAZUNORI NISHIO, Geballe Laboratory for Advanced Materials, YASUYUKI HIKITA, Stanford Institute for Materials and Energy Sciences, HAROLD HWANG, Stanford University, Geballe Laboratory for Advanced Materials, Stanford Institute for Materials and Energy Sciences — Doped $BaSnO_3$ is known to exhibit high electron mobility at room temperature, showing great prospects as an transparent conducting oxide. However, when grown epitaxially on perovskite substrates, thin films exhibit reduced mobilities compared with bulk single crystals due to scattering from the formation of dislocations at the interface of the thin film and substrate. In this emerging field, correlating synthesis growth regimes, structure, and stoichiometry with transport properties is critical for developing next level oxide electronic devices. Here, we will discuss our results linking growth conditions and transport properties of La-doped $BaSnO_3$ (BLSO) to enhance mobility. In addition to varying standard growth parameters, we deposited BLSO on a hygroscopic pseudo-perovskite buffer layer[1]. The pseudo-perovskite buffer acts as a sacrificial layer that can be selectively etched to produce conductive free-standing BLSO membranes, free of the underlying substrate. This allows us to minimize film dislocation density and examine BLSO transport properties in the limit of no substrate. [1]D. Lu et al., Nat. Mater.DOI:10.1038/nmat4749.

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Date submitted: 11 Nov 2016 Electronic form version 1.4