Abstract Submitted
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Metal-Insulator Transition and Weak Localization in Oxygen Vacancy Doped $BaSnO_{3-\delta}$ *Thin Films*[1] KOUSTAV GANGULY, ABHINAV PRAKASH, JONG SEOK JEONG, K. ANDRE MKHOYAN, BHARAT JALAN, CHRIS LEIGHTON, University of Minnesota — We present detailed temperature-dependent electronic transport in oxygen vacancy doped $BaSnO_3$ films grown on MgO(001), $LaAlO_3$(001), and $GdScO_3$(110) using high pressure oxygen sputter deposition. Various modes of high-resolution X-ray diffraction and scanning transmission electron microscopy confirm phase-pure, close to stoichiometric, smooth, epitaxial $BaSnO_3$(001). [1] As-grown films are insulating, but can be made conductive with n-type carriers *via* vacuum annealing, resulting in 300 K Hall mobilities up to 35 $cm^2V^{-1}s^{-1}$ at 510^{19} carriers per cm^3. [1] Film thickness, reduction temperature, and substrate (*i.e.* lattice mismatch) have been systematically varied, enabling study of the insulator-metal transition, and, in particular, 2D weak localization at low temperatures. The results provide significant insight into the active transport mechanisms in $BaSnO_3$ films. [1] Ganguly *et al.* APL Materials 3, 062509 (2015).

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