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Non-stoichiometry, Compensation and Disorder in Hybrid MBE-grown Alkaline Earth Stannate[1] TIANQI WANG, ABHINAV PRAKASH, WILLIAM NUNN, GREG HAUGSTAD, BHARAT JALAN, Univ of Minn - Minneapolis — Alkaline earth stannate has recently been of significant interest for transparent conducting oxide and power electronic applications owing to its wide band gap and high conductivity. In this talk, we will present a novel hybrid molecular beam epitaxy approach utilizing elemental solid source for Ba and Sr, a chemical precursor source for Sn and a rf plasma source for oxygen, for the growth of $BaSnO_3$ and $SrSnO_3$ films on (001) $SrTiO_3$ and (110) $GdScO_3$ substrates. High-resolution x-ray diffraction and reflection high-energy electron diffraction revealed single phase, epitaxial films and a layer-by-layer growth mode, respectively. Films' cation stoichiometry was determined using high energy Rutherford backscattering spectrometry. Using temperature dependent electronic transport measurements of films with varying cation stoichiometry, we will discuss how cation stoichiometry, charge compensation and structural disorder influence the metal-to-insulator transition, electron density, and mobility in La-doped $BaSnO_3$ and $SrSnO_3$ films.

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