Abstract Submitted
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Symmetry of Highly Strained $ZnSnN_2$ Thin Films[1] NANCY SENABULYA, Univ of Michigan - Ann Arbor, YONGSOO YANG, Univ of California,Los Angeles, CHRISTIAN SCHLEPUTZ, Swiss Light Source,Paul Scherrer Institut, NATHANIEL FELDBERG, Univ of Buffalo, ROBERT MAKIN, Western Michigan Univ, CHRISTINA JONES, Univ of Michigan - Ann Arbor, STEVEN DURBIN, Western Michigan Univ, ROY CLARKE, Univ of Michigan - Ann Arbor — Zinc Tin Nitride ($ZnSnN_2$) is a member of the ternary class of II-IV-V_2 semiconducting materials that have gained significant research interest in the recent past as a cheaper, earth abundant and environmentally friendly alternative to Indium-based materials used in photovoltaic and solid state lighting applications. Surface x-ray diffraction measurements performed at Argonne National Laboratory on single crystal thin films of $ZnSnN_2$ grown on (111)yttria stabilized zirconia(YSZ) substrates show a structural change from the wurtzite to the orthorhombic phase in films grown under low values of nitrogen flux and high substrate temperatures. This orthorhombic phase is characterized by in plane contraction and out of plane elongation of the unit cell lattice parameters, a phenomenon that theoretically results from the doubling of the wurtzite unit cell in the basal plane and ordering on the cation sub lattice [APL 103,042109(2013)].We are currently studying the crystal structure of $ZnSnN_2$ thin films using 3-dimensional reciprocal space maps and pole figure measurements in order to characterize the high symmetry orthorhombic phase achieved using epitaxy.

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