

Abstract Submitted
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Growth and Characterization of Non-Polar, A-Plane ZnO Thin Films PRIYA V. CHINTA, O. LOZANO, P. WADEKAR, L.H. CHU, Q.Y. CHEN*, W.K. CHU, Texas Center for Superconductivity and Dept. of Physics, University of Houston, TX, H.W. SEO, Department of Physics, University of Arkansas, AR, L.W. TU, N.J. HO, Center for Nanoscience and Nanotechnology, National Sun Yat-Sen University, NSYSU, Taiwan. — The growth and characterizations of non-polar a-axis-oriented epitaxial films of ZnO deposited by magnetron sputtering were investigated in comparison with the polar c-axis-oriented counterparts. The single-phase a-axis-oriented films were obtained at 700-degree C substrate temperature, whereas both a- and c-axis orientations were observed when deposited at lower temperatures ranging from 400 degree C to 600 degree C. The structural, morphological and temperature effects on photoluminescence (PL) behaviors have been studied. X-ray rocking curves show that the FWHM of (11-20) peak increases with temperature up to 600 degree C but start to decrease beyond 700C. Atomic force microscopy reveals significant changes in surface morphology as the growth temperature varies. Optical properties of the differently oriented films will be presented. PL emission in UV range was observed for the a-plane ZnO films which has been attributed to neutral donor bound exciton. The effect of Al-doping will also be discussed. *Also with NSYSU.

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