

Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Zinc Oxide Nanocolumns Periodically Grown on Silica Nanosphere Monolayers D MATEO, Univ of South Florida, N WRIGHT, Univ of Connecticut , A OSTOSKI, P MUKHERJEE, S WITANACHCHI, Univ of South Florida — ZnO nanocolumns (NCs) are promising building blocks for many existing and emerging applications owing to their unique optical, electrical, and piezoelectric properties. Specifically, the ZnO NCs could be used as seed layer for the growth of other oxide materials. Nanocolumnar ZnO is generally grown in randomly distributed arrays, where the entire substrate is covered and only through lithographic methods is selectivity of growth location achieved. We propose a method to be able to grow ZnO NCs in hexagonally closed packed structure with location tunability. Langmuir-Blodgett was used to construct a self-assembled monolayer of SNSs (3.5 μm , 1.18 μm , 850nm, 500nm and 250nm in diameter) on silicon substrates. Z-axis oriented ZnO NCs were grown on top of the spheres using the glancing angle pulsed laser deposition (GAPLD) technique. Column arrays grown in smaller SNSs diameter were vertical and grew in an hcp structure on top of each sphere. ZnO NCs aspect ratios were found to be dependent on underlying sphere size.

Domingo Mateo
Univ of South Florida

Date submitted: 11 Nov 2016

Electronic form version 1.4