Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

**Selective Growth of PZT Nanowires on Si Substrates Using Glancing Angle Pulsed Laser Deposition** D GONZALEZ-ACEVEDO, Univ. of Puerto Rico Mayaguez, D MATEO, M HORDAGODA, S WITANACHCHI, Univ. of South Florida — Thin films and nanostructures of the ferroelectric material Lead Zirconium Titanium Oxide (PZT) offer a multitude of applications in Piezotronics, and ferroelectric capacitor memories. While the growth of PZT thin films is well established, methodologies for the fabrication of vertically-aligned and spatially ordered PZT columns in nanoscale are not common. In this work an approach that uses a self-assembled nanoparticle template in a glancing angle pulsed laser deposition (GAPLD) process is presented. Lanthanum strontium manganite oxide (LSMO) was grown by laser ablation on a Si substrate masked by a monolayer of commercially available silica nanospheres (SNS) with diameter of 250nm self-assembled in a closed-pack hexagonal configuration (HCP) using Langmuir-Blodgett method. The HCP configuration of the mask will allows for the formation of LSMO islands on the crevices in between spheres, which will serve as seed layers for PZT growth. Scanning Electron Microscopy (SEM) was used to observe the grown PZT's morphology. Due to the ballistic shadowing effect introduced by the GAPLD, PZT columns in the form of hexagonal nanopillars evolved over the spatially ordered nanotemplate. Tunability of growth was achieved for certain PZT growth conditions. Morphological and structural properties of these structures were studied and showed a preferred orientation of growth of the (200) tetragonal/rhombohedral phase.

Derick Gonzalez-Acevedo
Univ. of Puerto Rico Mayaguez

Date submitted: 09 Nov 2016 Electronic form version 1.4