Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Heteroepitaxy of group IV-VI nitrides by atomic layer deposition[1] JEFFREY KLUG, Argonne National Laboratory, NICHOLAS BECKER, Illinois Institute of Technology, CARLOS ALVAREZ, Northwestern University, NICKOLAS GROLL, Argonne National Laboratory, CHAOYUE CAO, MATTHEW WEIMER, Illinois Institute of Technology, MICHAEL PELLIN, Argonne National Laboratory, JOHN ZASADZINSKI, Illinois Institute of Technology, THOMAS PROSLIER, Argonne National Laboratory — Heteroepitaxial growth of selected group IV-VI nitrides on various orientations of α-Al_2O_3 and MgO is demonstrated using atomic layer deposition. High quality, epitaxial films are produced at significantly lower temperatures than required by conventional deposition methods. The influence of substrate orientation on film structure and morphology as well as film resistivity and superconductivity are discussed. Transport measurements reveal a reduced room temperature resistivity and increased residual resistance ratio (RRR) for films deposited on lattice-matched substrates compared to polycrystalline samples deposited concurrently on native-oxide Si(001) and fused quartz substrates.

[1]This work was supported by the U.S. Department of Energy, Office of Science under contract No. DE-AC02-06CH11357.

Jeffrey Klug
Argonne National Laboratory

Date submitted: 15 Nov 2013 Electronic form version 1.4